

THE IRON AGE

THURSDAY, SEPTEMBER 4, 1890.

Duplex Compound Condensing Air Compressor.

A good idea of the general arrangement of the steam part of this air compressor can be had by examining the accompanying plan and side elevation. The steam

the cylinder, is under thorough control, and may be taken from that point, which is the most favorable in its dryness, reduced temperature and freedom from dust and other foreign matter. The admission of free air, being through a single tube, creates a constant and uniform draft of air in one direction only,

end of the stroke. Indicator cards taken from the cylinders of this compressor prove conclusively that not only is the cylinder filled with air at atmospheric pressure, but in some cases the line runs above the atmospheric line to the same extent that it runs below it in other air compressors. The air inlet valves are large metallic

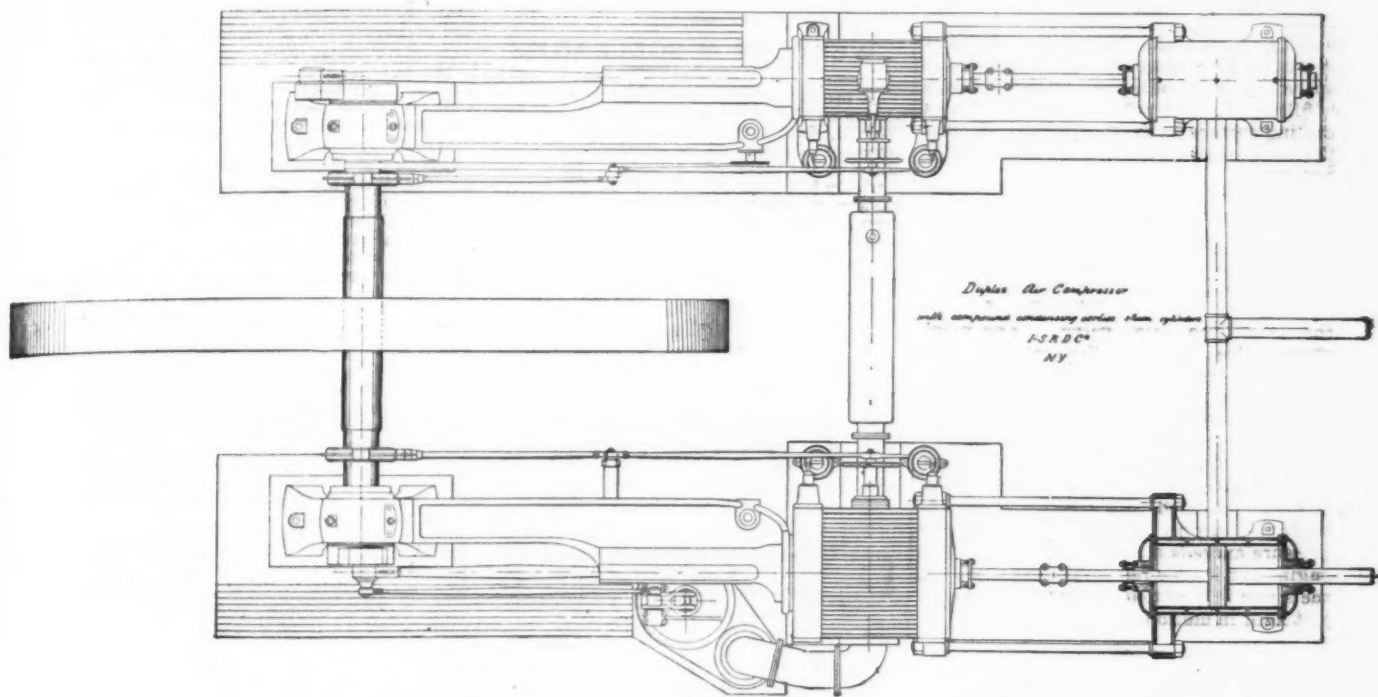


Fig. 1.—Plan.

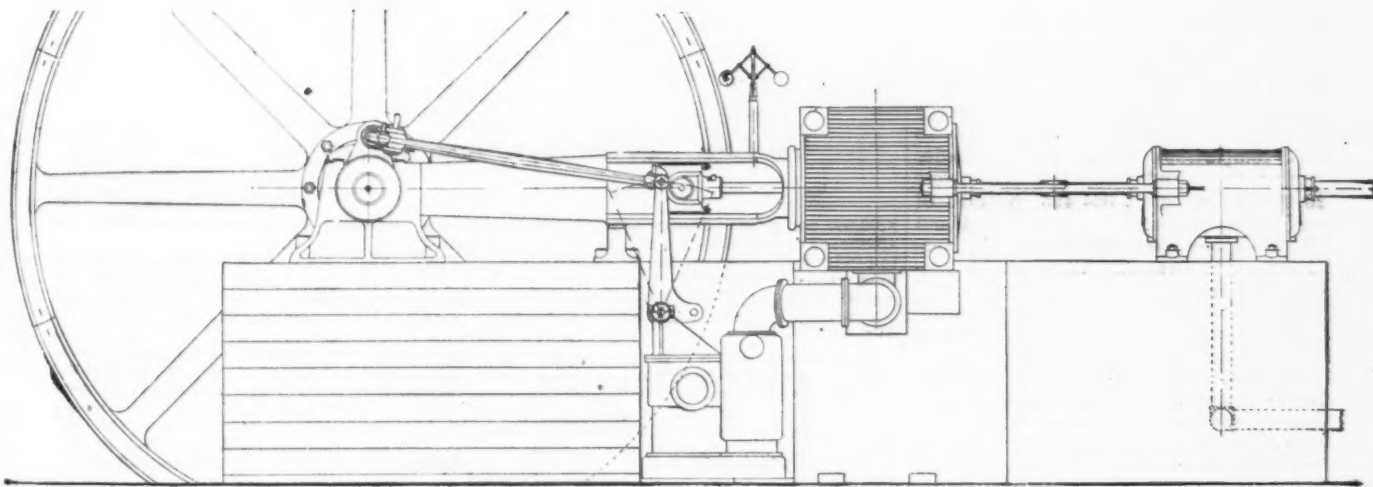


Fig. 2.—Side Elevation.

DUPLEX COMPOUND CONDENSING AIR COMPRESSOR.

passes from the high pressure cylinder to a receiver located between the two engines and thence to the low pressure cylinder. The condenser pump is worked from the crank pin through connections, as shown in Fig. 2. The valves are operated by the Meyer adjustable cut off.

The most important feature of the machine is the Sergeant's concentrated piston inlet cold air cylinder, which is shown in Fig. 3. The free air, before admission to

thus filling the cylinder at each stroke with air at full atmospheric pressure. In other compressors the air must be started from a state of rest, and put in motion through the inlet valves at each stroke, while in this compressor it is always moving into the hollow piston, and air being material—that is, having some weight—this uniform movement gives a momentum to the air which causes it to fill the cylinder to its fullest extent at each

rings which are not operated by springs, but which open and close by the natural momentum given to the valve by the movement of the piston. A study of the sectional cut will show that when the piston is moving in one direction the ring valve on that face of the piston which is toward the direction of movement is closed, while that on the other face is open. This is as it should be in order to discharge the compressed air

from one end of the cylinder while taking in the free air at the other. The position of each valve is almost instantaneously reversed at the point when the stroke is reversed. This change in position takes place without springs or other influence than the natural momentum of a piece of metal which is carried in one direction and is instantly reversed. The large ring air inlet valves are practically indestructible and admit of a large area of inlet, with but a small throw of the valve, thus quickly opening a large supply port and enabling a compressor to run at high speed without a reduction of efficiency, and with safety to the quick moving parts. As there are no inlet valves in the heads of the air cylinder, the space otherwise occupied by these valves is filled with cold water, thus presenting a cooling surface to the compressed air near the end of the stroke when the air is hottest.

An examination of the sectional cut of this cylinder will show that the clearance spaces are reduced to a minimum. There are no counter sunk spaces in the cylinder heads for inlet valves, but there is a single annular space to take the face of the large ring inlet valve. The valve covers this space at the end of each stroke, so that there is no dead space. The air inlet pipe extending through the cylinder head serves as a bearing and support for the piston. This air compressor, which is built by the Ingersoll-Sergeant Rock Drill Company, of New York, is the only one provided with a device which unloads the engine automatically when the pressure exceeds a certain fixed limit. The engine is not only relieved of the load, but the steam is throttled, so that the engine is just kept in motion.

Our Quicksilver Production.

The production of quicksilver in the United States and in other quicksilver producing countries has been made the subject of investigation by the Census Bureau, and a special report is about to be issued. The statistics have been prepared by Mr. J. B. Randol, under the supervision of Dr. David T. Day, of the Geological Survey. No similar statement was published as a part of the last census, so that comparisons cannot well be made. During the calendar year 1889 there were 26,464 flasks, or 2,024,496 pounds, of quicksilver produced in California. About 20 flasks, less than \$1000 in value, were produced in Oregon. There are 11 productive mines in California, with 36 furnaces. The productive mines and active furnaces employed 937 operatives, of whom 416 were engaged on surface work and 521 were employed under ground. The number of tons of cinnabar ore mined in producing the quicksilver was 95,714 tons. The expenditure was \$219,622 for supplies and \$626,289 for wages. The average cost per flask of quicksilver produced ranged from \$65.74 to \$21.66, the average cost for all being \$33.31.

The active establishments employed 62 steam motors, with a capacity of 21.90 horse-power; 54 boilers of 2438 horse-power, one electric dynamo and motor of 4 horse-power, and one water wheel of 3 horse-power—a total of 2197 horse-power in motors. Two hundred and forty-seven animals were also reported as employed, but it is probable a greater number were in use. The total capital invested in the 16 establishments is stated at \$1,331,114, of which \$680,470 is in mines and real estate, \$222,300 in furnaces, houses and other surface improvements, \$146,150 in machinery, supplies, tools and live stock, \$124,075 in quicksilver unsold, \$34,664 in bills and account receivable and \$125,456 in other assets. The following table shows

the production of quicksilver throughout the world for the past ten years, in flasks:

Year.	United States.	Spain, Austria and Italy.	Grand total.
1880.....	59,936	59,242	119,168
1881.....	60,851	60,083	120,933
1882.....	52,731	62,480	115,211
1883.....	46,725	68,394	115,119
1884.....	31,913	48,096	101,828
1885.....	32,073	66,281	98,354
1886.....	29,981	73,070	103,051
1887.....	33,760	75,037	108,797
1888.....	33,250	76,664	109,914
1889.....	26,464	74,772	101,236
Totals.....	407,675	685,936	1,093,611

WESTERN MISCELLANY.

An instance of the wonderful recuperative powers of the West is shown by the city of Wichita, Kan. This was one of the "boom" towns of Kansas, whose inflated values resulted in the inevitable collapse. Then, too, the town lost some 5000 or 6000 people by the opening of Oklahoma Territory. In spite of these reverses, however, the people have gone ahead with commendable courage, and have put more than \$500,000 in public improvements in the last two years. They voted

small compared to the capacity of the field if sufficient demand was made for it. The production of the salt works of Hutchinson, Kan., amounts to 3000 barrels per day. The salt is found at a depth of 400 feet and extends to about 300 feet in thickness. It is a solid rock and is not mined, but it is pumped to the surface. Fresh water is forced into the salt in the mine, and the brine which is thus formed is drawn up by pumps and is evaporated by steam and direct heat. The varieties of salt are No. 1, or common fine stock, and dairy or table salt.

Arkansas City, Kan., has a water power which is used at present to operate grain elevators, flour mills and other factories to the number of ten or a dozen. The water is taken from the Arkansas River and carried by a canal to the Walnut, giving a good natural flow and developing about 15,000 horse-power.

Cowley County, Kan., of which Arkansas is the largest town, has varied mineral resources. Coal has been found in one place at a depth of 150 feet, showing a 4 foot vein. The quality is fair and the quantity sufficient to supply home demand.

One of the finest natural water powers in the West is found in Pueblo, Col. The Arkansas River flows directly through the town with a fall of 17 feet to the mile. It is fed directly by the mountain streams and snows, and a failure of water has never been known there. No use as yet has been made of this great

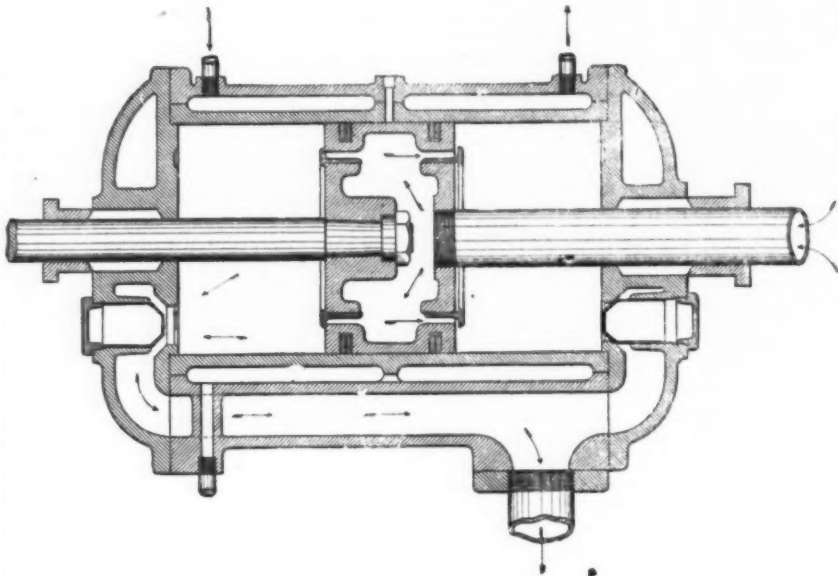


Fig. 3.—Sergeant's Concentrated Piston Inlet Cold Air Cylinder.

\$200,000 for a new county court house, and afterward added \$50,000 more to this amount to render it fireproof. This building is now almost ready to occupy. A new city hall, to cost \$100,000, is now being built, and five city schools have been finished this year at a cost of \$100,000.

Wichita has built this year 65 miles of sewers. There has also been laid nearly two miles of asphaltum, one mile of vitrified brick and one and one-quarter miles of jasperite on the streets. This last is a new composition, something similar to granitoid, and its cost was nearly \$3 per square yard.

Considerable development work has been done in the vicinity of Arkansas City, Kan., for the purpose of locating mineral property. It has resulted in finding zinc ore of excellent quality within half a mile of the heart of the town. Experts from Joplin and other zinc mining companies profess to believe that it will pay largely if mined, and companies are now being organized to work the ore systematically.

Iron ore of good quality has been found in the Cherokee strip about 40 miles south of Arkansas City. The extent of the field is not known and will not be until the strip is opened to settlement, but it is thought to be in quantity and quality sufficient to pay well when mined.

The salt fields of Kansas have an area of 25 miles in width and 50 miles in length. Hutchinson is the center of the district and the purest salt is found there, although it is produced profitably in other portions of the field. The salt was discovered about three years ago while wells were being driven to strike oil or gas. The production is at present

force, although its power is practically unlimited.

The red sandstone found in Frying Pan Gulch on the line of the Colorado Midland Railroad is an exceedingly beautiful and valuable stone, and has a pressure capacity of 15,000 pounds to the square inch. A shipment of 3000 car loads of this stone is being sent to Chicago this season. The Peach-blow stone, which is the color of the famous vase of that name, is found in the same locality. There is also a very valuable deposit of marble found on Rock Creek which is waiting for a larger population and a greater demand from the West to be developed.

A shortage of cars in the Connellsville coke region, equal to 25 per cent., is said to have become serious. Both the coke and iron industries are being held back, and the Pittsburgh Times says there is danger that some of the blast furnaces where the coke has not been stored will have to close down. The scarcity of cars has grown so rapidly that shippers, while they have plenty of coke at the ovens, have not been able to fill the orders. The latter have been rolling in heavily on account of the many mills that are being started at this season of the year. Some of the mills will be prevented from starting as soon as was intended.

Twenty steamships at Melbourne are tied up by a labor strike and the trouble affects all Australian ports.

BASIC BESSEMER STEEL - I.

Its Manufacture and Its Cost.

BY J. B. NAU, E. M., NEW YORK.

The acid Bessemer process is based upon the use of pig iron containing a percentage of phosphorus reaching beyond a very low limit—hardly a few hundredths of 1 per cent. Necessarily such pig iron can only be obtained by the smelting in the blast furnace of ores remarkably free from that element. Practically no appreciable percentage of phosphorus is eliminated during the smelting process. Such ores are becoming more or less exhausted in certain parts of the country. On another hand, many ore deposits, such as those of the New Jersey magnetites, which, for over half a century, have supplied the blast furnaces of this region and of Eastern Pennsylvania with some of the best magnetites of the United States, contain just enough phosphorus to reach beyond the limit at which such ores cannot be used alone for Bessemer pig. Others, very rich in iron and excellent otherwise, contain such a percentage of this element that they are even excluded entirely for the production of pig iron adapted to the acid process, while this very percentage would make them available for and particularly adaptable to the basic Bessemer process.

This latter process requires the use of pig iron containing a large amount of phosphorus. It is certainly destined in the Southern as well as Eastern and Western States to a great future, as it will at once render useful for the production of steel, ores now rejected for this purpose. Much has been said and done about this process in Europe. Its complete success in furnishing a quality of steel equal to, if not superior in certain respects, such as special softness, to that obtained by the acid Bessemer process, is a sufficient explanation of its extension and its daily increasing use in those countries.

In the United States, though not by any means new, it is not extensively developed yet and not very generally known. Having been connected for several years as superintendent with one of the largest basic steel works of the continent (de Wendel's steel works, Hayange, Lorraine and Jouff, France) and familiar with the practical working of the process and the result obtained, I propose in the following to give a summary, description and discussion of the methods employed, with remarks suggested by observations made in the course of the manufacturing of several hundred thousands of tons of such basic steel.

Pig Iron.—In the Bessemer acid process the pig iron used generally contains an average of 2 per cent. of silicon and 1.2 per cent. to 2 per cent. of manganese. Outside of these principal elements necessary for the success of an operation, there are others present in the pig metal, such as carbon, sulphur, phosphorus, copper, titanium, &c. Carbon is met with in all grades of pig irons, of which it is one of the constituents. The presence of phosphorus, copper, sulphur constitutes a danger for steel making. These last elements have a pernicious influence on the quality of steel as soon as their percentage goes beyond a certain narrow limit. They are of no use whatever to the operations which take place in the converter, and for this reason will be ignored for the present. The Bessemer process is a "pneumatic process"—that is, one in which no fuel is added, but in which the heat required for the operation is derived simply from the chemical reaction between the air blown in a metallic bath and the elements to be eliminated from that bath. The pig iron used must then contain certain elements in

quantities sufficient to insure, by their combustion in contact with the air blown into the apparatus, the high temperature necessary for the success of the operation. The elements which are the most easily oxidized at the high temperature developed in the molten bath, besides iron and manganese, are carbon and silicon.

Carbon.—Carbon in the pig metal, by its combustion in contact with the blast, develops a very great heat. The combustion of 1 unit of carbon burning to carbonic acid generates as much as 8080 calories; but this heat is of little avail to increase the temperature of the bath, the products of the combustion being carried away in the gaseous form, carrying out with them most of the heat thus generated. Furthermore, the whole of the carbon is not by any means burned to carbonic acid, but a large part of it is transformed in carbonic oxide, and for each unit of carbon thus burning to carbonic oxide only 2400 calories are generated, most of which is also carried away. Thus we see that carbon, although present in large amounts in pig irons, ordinary gray pig iron containing from 3.5 to 4 per cent of this element, does not contribute materially to increase the temperature of the bath, and practically in the comparison of the two processes must not be taken in consideration.

Silicon and Phosphorus.—Silicon is the first element to burn in the pneumatic process. The product of its combustion is silica. Each unit of silicon thus consumed generates 7830 calories. The 2 per cent. of silicon mentioned above as the average tenure of the pig metal used in the Bessemer acid process will furnish then $2 \times 7830 = 15,660$ calories. The greatest part of the heat generated by the combustion of this element remains in the metallic bath, silica not being a volatile compound, and remaining as slag combined with other elements. Besides carbon and silicon, some percentage of the iron and manganese contained in the pig metal are also burnt, furnishing as products of the combustion manganese and iron oxides, and generating thereby an additional amount of heat. But iron and manganese are to be found in both the acid and basic processes, and as it is only intended here to make a comparison between the pig metal required in either of those processes, I limit myself to such elements or quantities of each as constitute the real differences between the pig iron used.

In the basic process the pig irons used contain the same elements as the pig metal required for the acid process, but in different amounts. Whereas in the acid process phosphorus enters in very small quantities, this same element constitutes the most important factor in the basic process. As phosphorus by its combustion generates also a great amount of heat it is evident that, other things being equal, a portion of the silicon which is necessary in the acid process can be replaced in the basic process by a proportional amount of phosphorus, equivalent as far as heat of combustion is concerned. The calorific capacity of silicon, as it has been stated above, is 7830 calories; that of phosphorus, according to Dulong and Petit, is 4613, and according to Andrews, 4509 calories, or an average of 4550. Consequently pig iron containing 1 per cent. of silicon and 1.8 per cent. of phosphorus would furnish by the combustion of these two elements.

Silicon.....1 per cent. = 7830 calories.
Phosphorus...1.8 per cent. =
 $4550 \times 1.8 = \dots\dots\dots 8190$ calories.
or a total of.....16020 calories.

In the preceding calculation, I have confined myself to practical data, and for that reason I have not taken in consideration the temperature of the flame, nor the final temperature of the bath. However, it may be said in a general manner that the temperature developed in the converter, results as follows:

1. Heat brought in by the molten pig metal (1400° C.).
2. Heat brought in by the compressed blast (say, 120° C.).
3. Heat resulting from the combustion of manganese, iron, carbon, silicon and phosphorus.

The heat resulting from the two first sources, as well as that resulting from the combustion of manganese and iron, is the same in both cases. It can easily be shown that each unit of carbon burning to carbonic oxide, leaves in the bath 140 calories only; hence, even an important difference in the terms of carbons of the two pig metals would not have an appreciable influence on the total number of calories. The real difference must thus bear only on the amount of silicon and phosphorus contained in the pig iron, and it is on these quantities that the preceding calculations have been based. But as I have taken of those elements such quantities as are proportional to their calorific equivalent, the final heat must be practically the same. It could be established theoretically, taking in consideration the complex elements of such analysis, temperature of pig iron, blast, heat resulting from chemical phenomena, &c., that in treating a bath of pig metal containing in one case 1.8 to 2 per cent. of silicon and no phosphorus, and in the other 1 per cent. of silicon and 1.7 to 2 per cent. of phosphorus, the final temperature would be practically the same, say, from 1600° to 1700° C.

In the acid process, we have found that pig iron containing on an average 2 per cent. silicon would furnish 15660 calories. These two pig irons, that is, the one containing 2 per cent. of silicon, the other 1 per cent. of silicon and 1.8 per cent. of phosphorus would be thus practically equivalent as far as heat of combustion is concerned. It may be stated, therefore, in a general way, that in the basic process a pig iron containing from

0.6 to 1 per cent. of silicon and from
1.7 to 2 per cent. of phosphorus
can be treated with advantage and that within these limits the practical results obtained will be entirely satisfactory. Practice in Europe in all the basic steel-works has entirely confirmed these results. The average contents in silicon and phosphorus treated in many of those works fell within the above figures. But in the same manner as in the acid process, pig irons more silicious than those mentioned have been used. Similarly, in the basic process, pig irons containing silicon and phosphorus in quantities different from those stated above are treated in certain circumstances. Nevertheless these quantities are to be considered as representing the most favorable conditions whenever the ores smelted in the blast furnace allow of obtaining such a pig metal. Without taking into consideration the particular disadvantages which may result in the converter from too great a percentage of silicon and of phosphorus, it is obvious that an increase of silicon in the pig iron implies a higher temperature in the blast furnace, a greater consumption of fuel and consequently an increase in the cost of the ton of pig metal to be treated in the converter, without any advantages resulting therefrom.

When pig metal containing a greater percentage of phosphorus than about 2 per cent. is treated in the converter, the disadvantages are the following:

1. Increase of the cost of the steel resulting from the greater amount of lime required to saturate the excess of phosphorus, greater and more rapid destruction of, or damages done to, the basic lining and the bottom of the converter.
2. The increasing difficulty in effecting a complete dephosphorization of such a pig iron. It is a well known fact that the affinity of phosphorus for iron increases as the temperature rises. Now a higher temperature of the bath is a natural consequence of a higher percentage of phosphorus; hence the conditions of dephosphorization are less favorable.

Sulphur.—Sulphur and copper are as objectionable in the basic as in the acid process. Copper is more rarely met with than sulphur in pig irons or in ores. This latter substance is very widely found in

most ores, but it can be at least partially eliminated in the blast furnace by the use of lime and basic slags.

Manganese.—The beneficial effect of the presence of manganese in the acid and basic processes is so well known that it is hardly necessary to insist upon this point. It acts in the blast furnace as a desulphurizing agent. In the manufacture of basic steel especially it helps to prevent the return of the phosphorus into the metal toward the end of the heat—a valuable effect in the manufacture of soft steel—and its presence within certain limits improves the quality of the metal. A good percentage of manganese in a basic pig is about 1.5 per cent.

Since the very beginning of the introduction of the basic process in the different countries of Europe I have had occasion to treat all the different kinds of pig iron, manganiferous and non manganiferous irons, foundry pigs and forge irons, pig irons rich in phosphorus and silicon or containing smaller percentages of these elements, or large quantities of one of these and small quantities of the other. The result of all these experiments has led to the following figures, which practice has entirely corroborated as being those furnishing the most satisfactory results:

	Per cent.
Silicon.....	from 0.6 to 1
Phosphorus.....	" 1.6 to 2
Manganese.....	" 1.5 to 2

Lime.—The lime used in the basic process is added in the converter to saturate the silica and phosphoric acids. It must be as pure as possible and especially as free from silica as it can be obtained. The lime used in Hayange contained, on an average, from 1 to 2 per cent. silica—generally approaching the lower limit. A larger percentage of silica in the lime necessitates the addition of an excess of materials. The mass to be melted becomes greater, and as the same amount of heat generated has to act on a greater weight of materials, the final temperature of the bath is lowered and there is danger in casting the metal. It is also important that its composition should be as constant as possible, otherwise there will be a tendency to add an excess of lime, for fear that an excess of silica in the materials prevents complete elimination of the phosphorus.

Caustic lime obtained from the calcination of carbonate of lime should be preserved from the contact of moisture and used as freshly prepared as possible, as it has a great tendency to absorb the carbonic acid and moisture of the atmosphere, substances which it would become necessary to expel in the converter before the lime could exert its chemical action upon the silicon of the pig metal. This decomposition would necessarily absorb a certain amount of heat at the expense of the operation. The lime used at Hayange mostly was remarkably good; its composition was as follows:

	1	2
Silica.....	0.60	0.70
Alumina and ferric oxide.....	0.40	0.50
Lime.....	95.40	94.43 by difference
Magnesia.....	0.54	
Carbonic acid...	0.70	1.85
Water.....	2.00	2.45
Sulphur.....	0.10	0.07
	99.74	100.00

Materials Used in the Construction of the Basic Converter.—This material must be very refractory and at the same time very basic. The substances most generally used in Europe are dolomite and magnesia.

Dolomite is met with almost everywhere, and is obtainable at a very low price. It is a double carbonate of lime and magnesia, containing about 30 per cent. of lime, 20 per cent. of magnesia, 45 per

cent. of carbonic acid and 5 per cent. more or less of foreign matters, such as alumina, ferric oxides, silica, &c., according to its purity. We give below the analyses of the dolomite used at Hayange and at Creuzot (France):

	Hayange.	Creuzot.
Lime.....	29.920	29.800
Magnesia.....	19.810	19.873
Alumina.....	0.880	0.550
Oxide of Iron.....	1.170	2.000
Phosphoric Acid.....	0.270	0.070
Silica.....	1.280	2.100
Sulphur.....	0.027	0.025
Loss by fire.....	46.600	45.000

The dolomite is calcined in the same manner as limestone, either in special cupolas or in ovens. In cupolas very good products have been obtained. It would carry me too far beyond the limits of this article to enter into the details of the apparatus and of the fabrication itself, which requires experience that practice will soon get master of. On its being carried on properly depends the quality of the material obtained. A good and well calcined dolomite is sonorous and presents a black appearance. The shrinkage in calcining is considerable. It absorbs rapidly the carbonic acid of the air, and therefore has to be kept in special sheds until it is used. It is also very hygroscopic and quickly absorbs the moisture of the air to such an extent as to crumble to dust. It thus becomes unfit for use; but, which is of greater importance, it frequently happens that the calcination not having been carried to the point of disintegrating the material, it is not suspected, and the deteriorated material is used as lining in the converter and the making of the bottoms. This is often the cause of the accident known as "blowing off of the bottoms," and the rapid deterioration of the converter. However, this rapid deterioration might also be attributed to the bad drying of the apparatus before use.

Magnesite, natural carbonate of magnesia, is treated in identically the same way and in the same apparatus as dolomite, in order to obtain the calcined magnesia.

The fresh material to be used in the converter for lining having been obtained as briefly mentioned above, requires certain manipulations before it can be adapted to the purpose for which they are intended.

Construction and Maintenance of Converter.—The proper construction and the maintenance of the apparatus are absolutely necessary to insure success. The construction of the converter is similar to that of the one used for the acid process, the dimensions being only slightly increased for a given production of steel on account of the time to be added in the vessel. The basic material is properly calcined and carefully preserved in lumps until used, is crushed in appropriate mills to a coarse powder and mixed in the mill itself with tar free of water, because any introduction of water in the mass would certainly cause the material to be partially transformed in hydrates, from which might result afterwards a possible crumbling of the lining and even its entire deterioration.

The tar, before mixing, is gently heated, but not too much, for fear it would stick to the iron rollers of the crushers. The quantity of tar to be mixed with the refractory material may be estimated to be about 10 per cent. However, the man who has charge of the mixing room judges mostly by practice, from the appearance and the degree of plasticity of the mass, of the proper proportions of the ingredients. This mixture, when properly made and finished, is brought at once to the converter, in the lower part of which a frame has been previously fitted. This frame has the shape of the inside of the lining. The mixture of tar and dolomite or mag-

nesia is rammed between this frame and the shell of the converter by means of flat rams, which, in certain establishments, are heated to a dull redness. In others the ramming is done cold. The use of hot rammers is generally considered advantageous. After the material has been rammed to the height of the first segment of the frame, a second segment is put on top of the first one, and work is carried on in this way until about 10 inches from the mouth of the converter. The mouth of the converter is then finished by inserting one or two courses of fire bricks, generally acid bricks. The inside frame is then cautiously removed piece by piece and so as not to deteriorate the completed lining, not solid enough yet to resist any shock.

The bottoms are made with the same basic materials. They are also rammed with dull red rammers. The tuyeres used in these bottoms are made of either acid or basic material. In many establishments bottoms without tuyeres are used. In this latter case the iron plate of the bottom is perforated with as many holes as are deemed necessary for the free entrance of the blast. These holes are distributed all over the base plate and are about $\frac{1}{4}$ inches in diameter.

In these holes iron rods are inserted and the basic material is rammed all around. After this ramming is done the iron rods are pulled out, leaving numerous air passages. The bottoms in many establishments are at once carefully and thoroughly dried before being fitted in the converter. In other works it is done in the converters. The first method is preferable. The joint between the bottom and the basic lining of the converter is made with basic material. The drying of the bottom and lining of the converters is a very important question. It must be done carefully, gradually and thoroughly, because insufficient drying will always be the cause of deterioration of the lining and especially of the bottom. It does so very often at the first heat made in the converter. The quality of the steel obtained, too, depends largely on these conditions. A carefully built lining will stand 100 heats; a well constructed bottom from 18 to 20 heats.

When the original lining is worn out or burnt it has to be renewed. The converter is allowed to cool off. This operation can be hastened by blowing gently with the blowing engine. The sides of the converter are then carefully scraped from all loose material and metal and on what remains of the old lining a new lining is applied, rammed and prepared in the same way as a new lining. It takes two or three days to cool, reline and dry a new lining.

In some establishments, instead of ramming the tar and dolomite mixture to the shape of the converter, this mixture is compressed into bricks of proper shape in moulds. These bricks, after having been dried and baked, are used in the converter like ordinary bricks for making the lining. The joints made with a mixture of dolomite and are fluid enough for the bricks to be dipped into before being laid.

(To be continued.)

The returns of Germany's export and import trade for the first half of 1890 show that of iron and iron manufactures 229,935 tons were imported, as against 106,675 tons for the first six months of 1889. For the same periods the exports were respectively 84,715 tons and 117,420 tons. The exports of half and fully finished iron goods fell from 331,600 tons in 1889 to 403,840 tons this half year, while the exports rose from 24,575 tons to 41,050 tons. Of coal and coke the importation shows a slight falling off, 2,141,000 tons for this half, against 2,917,000 tons for the previous six months.

Compound Steam Air Compressor.

This air compressor is the natural outgrowth of one patented a short time since by A. P. Massey, and assigned to the Eames Vacuum Brake Company. In that compressor steam was used at boiler pressure in two steam cylinders to actuate pistons in two air cylinders, so as first to compress the contents of one air cylinder into the other air cylinder, and then to compress the contents of the second cylinder into the reservoir. The compressor of which we here present drawings is modified, inasmuch as while the air portion remains the same the steam is used in one cylinder at boiler pressure, but the piston of the second cylinder is actuated by the exhaust from the first or high pressure cylinder. In the position shown in Fig. 1, the steam is passing from the left hand

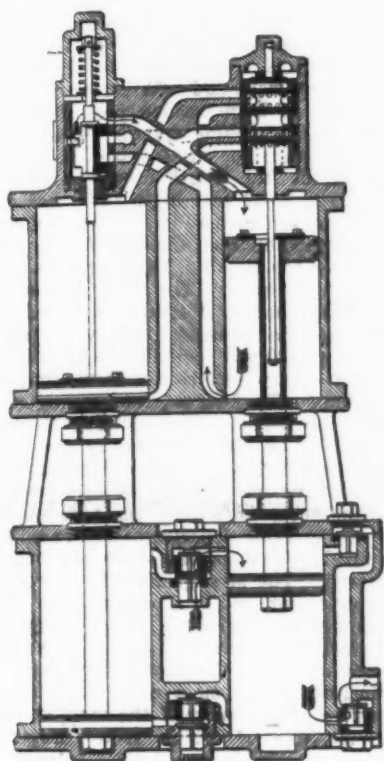


Fig. 1.—Section Showing Valves in One Position.

ton and cause its downward stroke. Only one piston moves at a time, and each completes its stroke before the other starts.

Both air cylinders are filled with air at atmospheric pressure. The contents of the larger cylinder, operated by the low pressure steam cylinder, are compressed into the smaller cylinder and are thence compressed into the reservoir. The valves are, of course, so arranged as to permit of this, as shown in Fig. 1.

The Supply of Natural Gas.

Professor McGee, of the United States Geological Survey, expresses the opinion in an interview that Professor Orton's theory regarding the exhaustion of the supply of natural gas is correct. He says: "It will fail; it may be a long time yet, but it will surely fail." There is little reason for doubt that this is true. All wells that have been heavily drawn upon for a period of three or four years have gradually diminished in pressure. Some have become useless. Others have been almost wholly exhausted, but, after being securely closed, they have recuperated until they have become stronger than they were at any time before. Such has been the experience of the Consumers' Gas Trust with some of the wells at Broad Ripple. The supply can be so husbanded

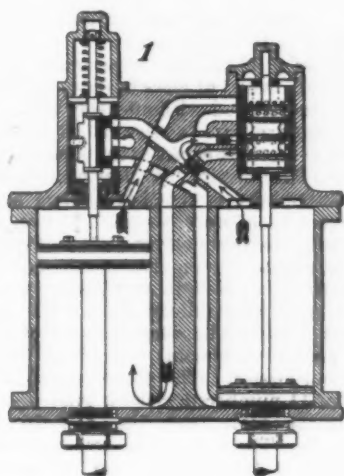


Fig. 2.—Section Showing Valves in Opposite Position.

has in many places found outlets where it was wastefully consumed or dissipated. Where it had lasted for ages it has been meagerly used. The heavy draughts from the reserves at present may be and undoubtedly are of exhausting volume. But having learned the proper restrictions of use, and having applied them as our gas companies are doing to the extent of their power, there appears to be little danger that those who are now enjoying the comforts of our modern fuel will, in their time of mundane existence be deprived of it. The controlling companies, however, must be reinforced in their efforts to husband the supply by statutory regulations restricting unnecessary use. The extravagant waste of it in illuminating farm land and city premises must be stopped.

Proposed Canadian Ship Railroad.

Canadians are aroused to enthusiasm on the subject of transporting laden vessels by rail, and they are not willing for the Tehuantepec road to be tried, or even for that at Chignecto to be completed, but want to begin a ship railway at once to connect Lake Huron with Lake Ontario at Toronto, and thus greatly shorten the route by the great lakes. The length of this proposed railway would be 69 miles. The elevation at the highest point in the ridges that the railway would have to cross is 664 feet above the level of Lake Ontario. The heaviest grade south of the ridges would be 30 feet to the mile, and north of the ridges 20 feet to the mile, the greater portion having long grades to the summit, where the railway would cross the ridge at the height of 327 feet above Georgian Bay. There would be lift locks, with protecting harbors at each terminus and four turn tables at certain points along the route to enable vessels to pass each other, similar to railroad switches, but without curves. There would be three

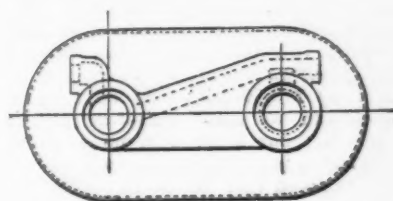


Fig. 3.—Plan of Steam Inlet and Exhaust Ports.

COMPOUND STEAM AIR COMPRESSOR.

valve chamber to the top of the right hand or high pressure cylinder, and a downward movement of the piston results. When this piston is nearly at the end of its stroke the plate on its top comes in contact with the lower tappet of its valve stem and the valve is moved to the position shown in Fig 2. This opens the passages leading to the under side of the low pressure piston, which is then moved upward. The same movement opens the exhaust from the upper side of the low pressure piston. As soon as this piston starts upward the spring on its valve brings the valve to the position shown in Fig. 2, where both steam ports of the high pressure cylinder are closed. When the plate on the low pressure piston reaches the upper tappet of its valve stem it raises the valve to its highest position and thereby admits live steam to the under side of the high pressure piston to cause an upward stroke. The completion of the upward stroke of this piston raises its valve to its highest position, as shown in Fig. 1, when the high pressure steam which has moved this piston upward can expand to the upper side of the other pis-

that exhaustion becomes improbable. The fact that wells can be so managed is inference that there is continuous generation, and that the production is sufficient to supply moderate demands indefinitely. Exhaustion becomes imminent only when there is wasteful or too rapid use of the supply. The scientists are giving us indefinite scientific information when they say simply that the supply will fail. How soon, under certain conditions, will the gas reservoirs be exhausted? How long, under certain other conditions, will the supply last? Can they not scientifically answer these questions? Though it is only within a few years that natural gas has received any sort of attention from the scientists, it is not a new thing, as is very generally supposed. In widely separated parts of the world it has, through deep penetrating crevices or fissures, issued from the interior of the earth for many centuries, signaling its existence in the wonderful "external fires" of Baku, along the shores of the Caspian sea, and, through untold ages, rising within tubes of bamboo from the salt mines of China into serviceable flame, while in our own country it

railway tracks of the ordinary 4 feet 8½ inch grade, but the rails would be from 100 to 110 pounds to the lineal yard. The total cost is estimated at \$12,000,000, being one-half the cost of a ship canal of the same capacity. The ship railway would be sufficient, with three large locomotives to transport a vessel of 2000 tons weight, including vessel and cargo, at the rate of 10 miles per hour or seven hours for the 69 miles. Such a ship railway as proposed would save about 400 miles of lake navigation and 28 miles of canal between the head of the lakes and Montreal. In addition to the saving in lake and canal navigation that would be accomplished, the Canadians claim that there would be the additional advantage of a cooler passage for grain from the Northwest to the seaboard by the St. Lawrence than by way of Buffalo, where the grain, they assert, becomes heated on the way to the seaboard. This route would undoubtedly affect the trade on the great lakes, saving three days between Duluth and the Atlantic seaboard, in addition to reaching an Atlantic port some 100 miles east of any reached by the American route.

The Results of Reciprocity.

Secretary Blaine's convictions relative to reciprocity and the necessity of a wider market for manufactured products are irrefragable. In a speech delivered in Maine, last week, Mr. Blaine made the point that the balance of trade with Cuba, Mexico and Latin America is heavily against us, and that the way should be more freely opened for the admission of American products into those countries. He wished "to declare the opinion that the United States has reached a point where one of its highest duties is to enlarge the area of its foreign trade. Under the beneficent policy of protection we have developed a volume of manufactures which, in many departments, overruns the demands of the home market. In the field of agriculture, with the immense propulsion given in it by agricultural implements, we can do far more than produce breadstuffs and provisions for our own people. Nor would it be an ambitious destiny for so great a country as ours to manufacture only what we can consume or to produce only what we can eat." He explained that he spoke of "a system of reciprocity not in conflict with a protective tariff, but supplementary thereto and presenting a field of enterprise that will richly repay the effort and energy of the American people." "Let me tell you," he added, "that last year—1889—we lost \$41,000,000 in Cuba, from which our imports were \$52,000,000 and to which our exports were only \$11,000,000. Forty-one million is a pretty large sum to lose in one island in a single year. In the Republic of Brazil we lost \$51,000,000. Our imports from Brazil were \$60,000,000. Our exports to Brazil were \$9,000,000. In Mexico we lost \$10,000,000. Imports from Mexico were \$21,000,000; our exports to Mexico were \$11,000,000. To sum it all up our imports from countries south of us, both insular and continental, on this hemisphere, were \$216,000,000; our exports to them were \$74,000,000. The balance against us in our trade with those countries therefore is \$142,000,000, exceeding our gains from all the rest of the world by \$13,000,000. By no figure of speech can we flatter ourselves into the belief that our trade with our American neighbors is in a prosperous condition." It must be noted that the Board of Trade in Buffalo, and other commercial bodies more particularly in the West, are inclined to indorse these views.

A number of capitalists, of Youngstown, Ohio, interested in the development of that city, recently raised a fund and sent A. J. Packard to the New England States to interview a number of manufacturers desirous of locating in the West, and to present favorable propositions to remove to Youngstown. Mr. Packard has returned home, and it is said that his trip was successful and will result in the addition of several important industries to that city.

At Pittsburgh, on the 28th ult., Judge Achison, of the United States District Court, handed down a lengthy opinion in the case of George Westinghouse, Jr., against the Chartiers Valley Natural Gas Company. The suit was for the alleged infringement of letters patent relating to pipe line joints and lines for conducting liquids and gases, more particularly those used for conducting natural gas. The alleged infringement was the combination of a pipe line composed of sections of pipe connected at the joints by couplings, with a separate gas tight chamber surrounding the main. The court held that the patent known as the Verner patent, used by the defendant company, was destitute of patentable novelty in view of the Westinghouse patent of July 1, 1884. The

court held that the entire invention was disclosed in the application of John Nicholson, Jr., filed January 10, 1884. The court held that the patent used by the defendant company does not infringe, and a decree was drawn dismissing the bill of complaint with costs. The case has had much interest for those concerned in the gas and oil line business. The decision practically throws the use of tight joints open to all.

The Proposed Uniform Freight Classification.

A special committee, consisting of Traffic Manager Bird of the Milwaukee and St. Paul and General Freight Agent Johnson of the Rock Island, has submitted a report to Chairmen Faithorn and Midgley, of the Western Freight Association, regarding the proposed new uniform classification. It says the general committee on uniformity of classification has concluded its labors. It conceived its duties to be limited to the consideration of the three classifications most widely used, and its labors were directed to merging the three into one, which could be adopted as a substitute for the three. It declined to consider memorials presented to it, or to receive delegates representing any interest, because of the belief that to hear argument in any given case would carry with it an obligation to hear counter argument, and this would have opened the doors to a process that would have prolonged their labors for a term of years.

The essential part of the programme is a permanent board of classification, to whom should be referred without delay the questions that are sure to arise as to possible errors or inconsistencies in the new classification. Uniformity of classification, the committee says, is contingent upon a reconstruction of rate sheets. The recommendation involves eleven classes. Present rates are based upon five numbered and five lettered classes, in addition to which there are a multiplicity of special commodity rates. The classification of less than carload shipments is confined to the first four classes. The proposed basis consists of 11 numbered classes, graded on a decreasing scale from the first to the eleventh. The articles in less than carloads have been distributed among the first five classes, and with slight exceptions all of the carload classes are embraced in the sixth to the eleventh, exclusive, the exceptions being that some articles in carload of extraordinary bulk or value are rated higher than sixth class.

A hasty glance at the proposed classification will lead to the belief that large reductions have been made. For example, coffee and analogous goods, at present fourth and fifth, have been graded fifth and seventh. On a new scale of rates, which is essential to the completion of the work, the new seventh class is equivalent to the fifth; the new fifth equivalent to the present fourth, and the new sixth equivalent to the present class A, Western classification, and this principle rules through the same plan. The committee believes that the general result of the new classification in connection with the proposed rates will produce substantially the same revenue obtained by present methods.

One of the purposes of distributing traffic among eleven classes is to avoid a multiplicity of special commodity tariffs. Commodity rate sheets will become necessary, however, to some extent. For example: The proposed classification on live stock, coal and oils refers to rate sheets. Lumber cannot be handled by Western roads on classified rates, because they would come into conflict with the recognized system of differentials. The same principle applies to other important items of traffic, but upon the whole the

distribution of general merchandise among the eleven classes will, in the judgment of the committee, make possible the abrogation of many special rates or commodity tariffs.

In the judgment of the committee representative committees should be created at once to prepare distance tariffs for State and interstate traffic, and confer with the various authorities, to the end that their acquiescence may be secured. The committee does not believe that uniformity of classification can be secured without co-operation of the various State Commissioners, and it urges that the work in this direction shall be considered of first importance.

The Gates Iron Works.

The Gates Iron Works, 50 to 58 South Clinton street, Chicago, are making extensive improvements in their plant. On the lot adjoining the old works on the south they have built a large shop, 68 x 150 feet. This is a massive structure, with heavy brick walls and with strong trusses supported on huge wooden posts to form tracks for traveling cranes. There are three runways for these cranes, each extending the full length of the building. The center is 22 feet high, and those on the sides are each 19 feet. Two trolleys are mounted on each side and one in the center, or five in all. These trolleys are operated by hand. The center trolley is intended to handle the heaviest machines built by the company, weighing from 40,000 to 80,000 pounds each. Eight erecting gangs can be run at one time in this shop. The floor is paved throughout with cedar blocks. The building is well lighted by skylights extending the full length of the roof. The old shop will hereafter be used for tools exclusively, and the room gained by the addition of the new erecting department will speedily be filled by new machine tools now being received. The arrangement of the works is convenient and well adapted to the handling of material. Everything is weighed in at the door of the old shop, passes down to its proper place, and is ultimately loaded on a car running on a track down the center of the shop, at the extreme end of which is a turntable connecting with a track extending into the lower end of the erecting shop. Passing forward, everything is weighed for shipment at the street door. A continuous forward movement is thus provided. The new facilities will enable the company to do four times as much work as before. This enlargement has been imperatively demanded by the increase in their business. The manufacture of mining machinery in which they have recently engaged more extensively has largely increased their trade. They are also fitting up new offices, which will give the managers of the company and the clerical force much more room. The offices will be finished in hard wood with hard wood floors, and are intended to be attractive in appearance as well as convenient in arrangement. The rooms formerly used as offices are to be fitted up as a laboratory and experimental department. A Gates crusher will be set up and a complete concentrating outfit will be added, so that ores can be tested and a practical determination can be made of the character of the machinery required in special cases. This is a feature of the improved works which is expected to be highly approved by the mining interests of the West.

A strike against the Manhattan Brass Company, of New York, has lasted 15 weeks, and 750 men in the Amalgamated Association of Brass Workers are said to be paying \$1500 to support the strike.

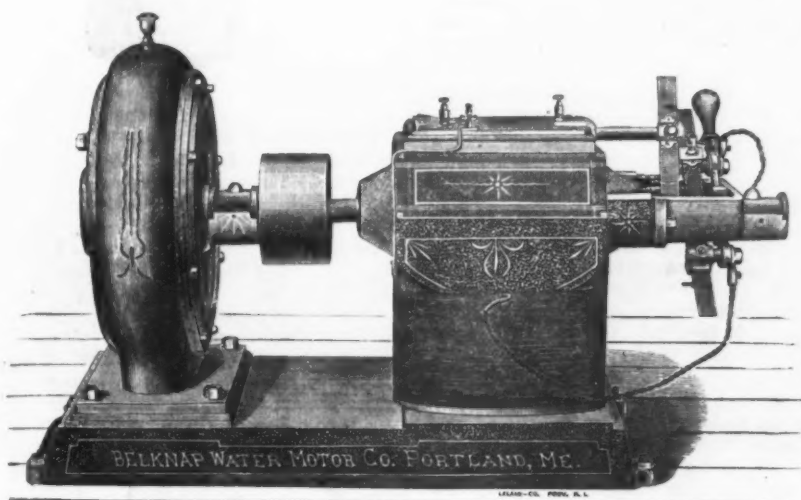
Combined Motor and Dynamo.

The engraving represents a dynamo mounted upon the same shaft with a water motor, by which it is driven. This combination has been found to be well adapted to localities having no central electric lighting station, but where water is obtainable for operating the motor. The dynamos are built in 10, 20 and 30 light sizes, and the motors are capable of bringing these lights to full candle power under a maintained water pressure of 65 pounds. The motor is built on the principle of the turbine, and the buckets run very closely to the water chute. The full force of the water is exerted on the wheel at a point nearer the orifice than in any motor of this type yet produced. In the construction of the dynamo special attention has been given to the working parts, with a view to reducing the amount of wear and the expense of the wearing parts. The armature consists of an iron core, square in cross section, mounted on a steel shaft; this core is wound with two coils of insulated copper wire which are laid on so as to fill out the space from the square to the circle, making

heavy current takes place. The current from the exciting coil passes through the segments and brushes that press on them. This current is but a very small fraction of the working current and the brushes are therefore subject to a very small load and sparking is entirely avoided. The combination of motor and dynamo is made by the Belknap Motor Co., of Portland, Maine.

The Silver Law.

A practical summary of the silver law, in its relation to currency and business, is given by a financial expert, which answers many questions heard from day to day. The law requires the Secretary of the Treasury to buy silver bullion to the amount of 4,500,000 ounces, or so much thereof as may be offered, in each month, at the market price, provided this does not exceed one dollar for 371.25 grains of pure silver. In payment for such purchases the Secretary of the Treasury issues Treasury notes of the United States in such denominations as he may prescribe, not less than one nor more than \$1000.



COMBINED MOTOR AND DYNAMO.

the completed armature cylindrical in form. The shaft has two bearings, one at each end of the armature, and is provided with self-oiling boxes. The commutator consists of a cylindrical piece of hard insulating material keyed to the shaft and a piece of metal attached to its surface. These pieces of metal are: 1. A ring of phosphor bronze encircling one end of the insulating cylinder, this being known as the "collector ring." 2. Two semicircular segments of brass encircling the other end of the cylinder. These are the "fixed segments." 3. Two semicircular segments of phosphor bronze secured to the fixed segments by screws. These are the "removable segments" and constitute the wearing part of the commutator. They may be taken off and replaced by new ones when worn, by simply removing one screw in each segment. One coil of wire on the armature, called the "exciting coil" has its two ends connected to the two fixed segments and the other coil called the "working coil" is connected to the collector ring and to the shaft of the machine. The special advantage of this arrangement is the simplicity and the fact that there is no make and break in the working current of the machine by passing it through brushes. An uninterrupted metallic connection is maintained, which avoids all the ill effects that necessarily follow careless adjustment of the surfaces where the reversal of a

These notes are redeemable on demand in coin, and when redeemed may be reissued; but no greater or less amount shall be outstanding at any time than the cost of the silver bullion and the standard silver dollars coined therefrom, then held in the Treasury purchased by such notes. These Treasury notes are a legal tender for all debts, public and private, except under a contract with a stipulation to the contrary, and are receivable for customs, taxes and all public dues, and when so received they may be reassued. They may be counted as a part of the reserve by national banks. Upon the demand of the holder of any of these notes the Secretary of the Treasury shall redeem them in gold or silver coin at his discretion. The Secretary of the Treasury is directed to coin into standard silver dollars 2,000,000 ounces of bullion per month until July 1, 1891, and after that as much as may be necessary to provide for the redemption of the Treasury notes provided for by the act.

Abraham Gottlieb, of Chicago, has been appointed consulting engineer of the World's Fair Directory. With the selection of a consulting architect the consulting board will be completed, but it appears that the Committee on Grounds and Buildings is having a good deal of trouble over this matter. It is said that the members of the committee cannot agree further

than that they have decided to take a Chicago man. Mr. Gottlieb is a bridge engineer. He has been a resident of Chicago since 1866, except a period extending from 1878 to 1885, when he resided in Pittsburgh. He was for a number of years chief engineer of the American Bridge Company, and built the old bridge across the Missouri River at Omaha and the bridge at Leavenworth, Kan., while with this company. Mr. Gottlieb was also the engineer of the Keystone Bridge Company for many years, and during his residence in Pittsburgh was president and general manager of the company. He built the bridge across the Missouri at Plattsmouth, Neb., the one at Blair, Iowa, and the bridge across the Ohio River at Point Pleasant. He also built the Baltimore and Ohio Railroad bridge across the Susquehanna River. He is about 60 years of age and received his education at Prague, in Bohemia.

The regular monthly meeting of the Wrought Iron Pipe and Tube Manufacturers' Association was held in the Fifth Avenue Hotel, New York City, on Tuesday, the 26th ult. The attendance was large, about 20 firms being represented. Campbell B Herron, chairman of the association, presided and J. H. Murdock acted as secretary. The condition of the trade was thoroughly discussed, and it was the opinion of the members present that the outlook was very encouraging. No change was made in prices except in boiler tubes. It was formerly the custom to allow a large discount on the large sizes, but this has been changed, and the discount is now the same on all sizes from 2 inches and larger. The following are the correct discounts now in force:

Wrought Iron Pipe.	Per cent.
Butt, black.....	47½
Butt, galvanized.....	40
Lap, black.....	60
Lap, galvanized.....	47½
Boiler tubes, 1¼ inches and smaller.....	45
Boiler tubes, 2 inches and larger.....	50
Casing.....	50

The Baldwin Works are building 20 ten-wheel freight engines for the Lake Shore and Michigan Southern road. The cylinders are 17 x 24 inches, and the driving wheels 56 inches diameter over 8 inch tire. The total weight of engine in working order is about 100,000 pounds, 73,000 pounds of which is on the drivers. The boiler is 52 inches diameter at the front end, 186 flues 2 inches diameter and 12 feet long. The fire box is 96 x 34½ inches, placed between the frames and extends over the rear axle, the grate being inclined. The brick arch is carried by water tubes. The longitudinal seams are lapped and triple riveted. The driving wheel base is 13 feet 3 inches, of which 8 feet is rigid, the front pair of wheels being blind. The engine truck has a rigid center and cast iron wheels. Driver brakes of the American pattern, and operated by air, are applied to all the wheels. The tender is equipped with the Westinghouse automatic brake on all its wheels; it has an iron frame and a tank of 3100 gallons capacity.

The Southern Railway and Steamship Association has issued a Joint Manufactured Iron Tariff No. 10, taking effect September 12. The new rates are on the basis of 12 cents for carload lots and 16 cents for less than carload lots from Birmingham to Cincinnati; 10 and 13 cents respectively from Chattanooga, and 12 and 16 cents from Anniston, Ala.

At the present writing the following blast furnaces are under construction in Virginia: Roanoke, Salem, Radford, Max Meadows, Bristol and Graham.

NEW ENGLAND NOTES.

A new industry, to be known as the Nashua Lock and Hardware Company, will soon begin operations in Nashua, N. H. The organization has just been completed and is capitalized at \$20,000. Work will be begun in the vacant building formerly occupied by the Nashua Lock Company, and a large number of hands will be employed. F. O. Monroe has been elected treasurer and manager.

At a special meeting of the stockholders of the Connecticut Motor Company, recently held, it was voted to increase the capital stock from \$30,000 to \$40,000, the present stockholders to be given the preference in subscribing for the increase until October 1.

J. P. Hussey, whose mills and plow factory at Gilmanton, N. H., were destroyed by fire a year or two ago, is rebuilding and expects to resume work again this fall.

At the Wamsutta Mills, New Bedford, a new engine is to be put in to indicate 1500 horse power. It will be a double tandem compound Corliss, having a high and low pressure cylinder on each rod. The high pressure will be 24 inches and low pressure cylinder 44 inches in diameter. The old-fashioned walking beam engine previously used is undergoing repairs.

The addition to Bristol (Conn.) manufacturing industries by the establishment of the Turner Heater Company, of Meriden, Conn., is now a certainty, as the application for stock has exceeded the amount necessary. The factory will be established with a capital of \$50,000, and will start in on a very promising basis.

The new plant of the Biddeford stove foundry, recently removed from Biddeford, Maine, to Auburn, Maine, will be completed and ready for operations within a few days. The main building is 40 x 80 feet, three stories high, with sheds 70 x 25 feet. The old machine shop, 80 x 60 feet is being remodeled. An addition to the molding room, 30 x 70 feet, will be built at an early date. About 500 tons of pig iron will be used per year in these works and 45 men will be employed.

The new marine railway plant of the East Boston Dry Dock Company, is fast nearing completion. The exterior of the building, 100 x 30 feet, is completed and the new "Galloway" boiler is just being set up. The large chimney is also completed. This railway is some 240 feet in length and will haul a 2000 ton ship out of the water. To raise a vessel of this size requires a steam plant capable of producing 6000 horse power. This power is applied by a series of cog wheels working on each other. These are now in and the largest measures 10½ feet in diameter, with a weight of 7½ tons, the teeth of the cogs being nearly a foot in width.

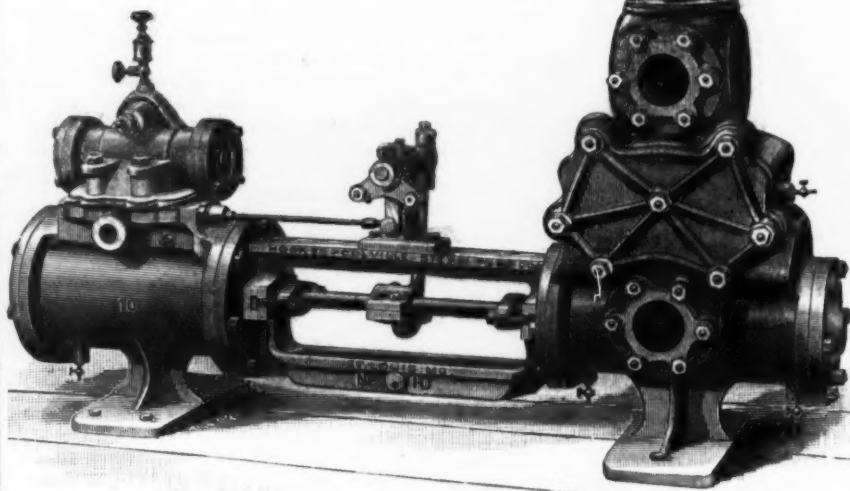
The tack industries of Taunton are among the most important in the Commonwealth. Massachusetts is the greatest tack manufacturing State in the Union, and the most successful plants are located in Taunton and vicinity. Careful investigation shows that that city is pre-eminent in furnishing advantages for the manufacture of tacks and small nails, and factories there can successfully compete with the majority in the West and South. The latest statistics on the tack industry compiled in 1885 show that 13 States are interested in the tack industry as follows:

State.	Concerns.	Machines.
California.....	1	75
Connecticut.....	4	165
Delaware.....	1	6
Illinois.....	5	155
Maryland.....	2	37
Massachusetts.....	58	2,045
Missouri.....	1	4
New Jersey.....	2	10
Ohio.....	5	101
Pennsylvania.....	7	213
Rhode Island.....	2	30
West Virginia.....	1	35
Wisconsin.....	3	47
Total.....	92	2,923
New England States.....	64	2,240
Middle States.....	10	229
Southern States.....	3	72
Western States.....	15	382

Since the above table was prepared several concerns have gone out of the business. Three of these were located in Massachusetts, one in Maryland, one in Wisconsin and four in Pennsylvania, of which two were located in Pittsburgh. There are no tacks made at present in Missouri, Delaware or Maryland, so that the number of States has been reduced to ten and the number of machines thus made idle is nearly 8 per cent. The statement made by some that Western tack manufacturers can make goods cheaper than Eastern men is said to be misleading by prominent manufacturers in Taunton. It is true that the West has cheap motive power, and wages may not be quite as high as in the East, but a comparison of cost

of material and of manufacturing and preparing goods for market with the cost of the same in Massachusetts, shows that the balance of advantages is largely in favor of the latter. The great advantage that the Eastern manufacturer has over the Western is in handling of material used. A large portion of the iron consumed comes from Europe and has never been made in this country. There is considerable local competition in the business, and this tends to keep prices down as well as profits, and Eastern plants can undersell those in the West, even in the territory naturally covered by the latter. Several attempts have been made to establish this industry in the South. A tack factory was started a few years ago at Birmingham, Ala., but the works were closed for an indefinite period about two months ago. Two concerns at Pittsburgh have been compelled to close their works from financial difficulties due mainly to unequal competition of Eastern factories that could handle their material cheaper. This branch of the iron business in New England is to-day practically in the hands of Massachusetts. More than two-thirds of the tack business is controlled by that State and fully three-quarters by all of New England. From the present outlook there is not much likelihood of New England losing its grasp on the tack industry.

A peculiar accident happened not long ago in a New England factory which cost several thousand dollars to repair. Its cause could be traced directly to the oversight of the engineer who had furnished the plans for the erection of the engine plant and the setting up of the condenser. A 500 horse-power Corliss engine was belted direct to the shaft with a water wheel developing 300 horse-power. At certain hours



THE HOOKER FIRE PUMP.

each day the amount of power taken from this shaft varied widely. The engine was connected to exhaust into an independent jet condenser. The machines were started up and ran along smoothly and nicely for several hours. Eight hundred horse-power was furnished by engine and water wheel. In a few minutes of time the power need for the mill work was altered from 800 to 150. The result was that the governor upon the Corliss engine closed the steam valves, but the water wheel continued its revolutions. Power was then transmitted to the engine fly wheel, and the engine cylinders became a pump, and the exhaust pipe to the condenser a suction pipe. The result of this combination is not hard to see: Two practically incompressible bodies met, steel and water, and the whole portions of the engine, a few seconds later, were not as easily found as the broken portions.

The Newport (Ky.) branch of the Addystone Pipe and Steel Works began this week turning out the largest pipe casting ever attempted in this country, being 5 feet in diameter—almost double the largest size heretofore made. Each pipe will be 12 feet 4 inches long. The thickness will be 1½ inch. The weight of each section will be 6 tons. The ladle used in making the cast will hold 9 tons of molten metal. The pipe goes to Milwaukee to be used in obtaining a water supply from the lake. Eight hundred lengths are to be made, or 4800 tons.

Fire Pump.

A Hooker fire pump embodying the latest improvements, made by the Hooker-Colville Steam Pump Company, is represented by the accompanying engraving. This pump is especially designed and constructed to meet every requisite of a fire pump, and contains all the valuable features which have made it so well known. The cushion is on exhaust steam and the valve movement is positive and noiseless. This pump, by the new arrangement of the inlet valves above the pump barrel, always stands charged and ready for use. It will start at any point of its stroke and can be run to the full limit of the power of steam. The pump is provided with

removable composition linings for the water cylinders, gun metal water pistons and phosphor bronze piston rods.

The annual exposition season has returned, and within the past week St. Louis, Detroit and Minneapolis have opened the doors of their respective exposition buildings. Other Western cities will rapidly follow. In every case manufacturing industries are taking a more prominent part in these demonstrations of enterprise and progress. At Creston, Iowa, last week, the unique blue glass palace was the basis of an exceedingly interesting exhibition of local enterprises. At Ottumwa, in the heart of the coal fields of Iowa, a coal palace is being erected, which will in a few weeks constitute one of the chief attractions of a large agricultural and mechanical display.

The employees of the mechanical department of the Illinois Steel Company (Union Works) gave a surprise to their timekeeper, William Able, at his residence, on the evening of August 19, by presenting him with a very handsome gold watch and chain and locket as a token of respect on his leaving the Union Works to fill a position for the same company at the South Chicago Works.

THE WEEK.

The manager of one of the European steamship companies explains that the rivalry among the various lines in making short passages is really a struggle for precedence in carrying the United States mails. Where rival lines go to the same port, the United States mail, as is well known, is sent by the fastest vessel. This is determined by taking the average speed made by a vessel during her three last trips. The logs are sent to the post office, and there this average speed is determined. So eager is this rivalry and so close are the records that one vessel of the White Star Company may carry the mail one trip and her rival of the Inman Line the next. This has repeatedly happened during the last summer. As averages are computed each trip, the difference of a few minutes means the loss or gain of valuable freight. The safety valve prevents "crowding steam" beyond the limit fixed by Government inspectors.

China is exporting more cotton of late, there being an increased demand from the new spinning mills in Japan.

A cotton harvester has been invented by J. Alfred House, of Bridgeport, which, it is claimed, can do the work of 80 cotton pickers. A Galveston firm is interested in the proprietorship.

The output of the phosphate mines of South Carolina last year was 510,000 tons, of which 80,000 was used by local companies in the manufacture of fertilizers. The total export last year was 309,396 tons, against 282,201 in 1888.

The official report of the trial of the new cruiser San Francisco, just completed on the Pacific coast, shows that her mean speed was 19 $\frac{1}{2}$ knots per hour, subject to slight correction. This speed, which will entitle her builders to a premium of \$100,000, is slightly in excess of the rate made by the Philadelphia.

Guatemala has ratified the stipulations of peace with Salvador, as approved by the Diplomatic Corps and President Ezeta. The principal condition is, in its practical effect, a restoration of Salvadorian government as before the war, only on a basis of absolute independence, which was really the only point in dispute.

High priced beef through a large section of country has been the consequence of the switchmen's strike at the packing houses in Chicago. The true animus of the strike now comes out, if reports are correct, in the statement that a high official in the Switching Association is jointly interested in the packing yards at Kansas City and Omaha, and that the disturbance is simply a device to thwart the new purchasers of the Chicago yards in their purposes. One of the old packers, Nelson Morris, has organized the Interstate Stock Yard Company, under the laws of New Jersey, with \$1,000,000 capital, and will slaughter cattle at the seaboard, instead of depending on refrigerator cars.

Another South American bank has collapsed, this time the National Bank of Uruguay, which, according to the latest reports, will have to face a deficit of not less than \$10,000,000, a sum but a trifle less than the whole annual revenue of the republic. The Argentine Republic set the bad example.

For the screw propeller on the war ship Princeton Captain Ericsson was never paid, the amount of his claim being \$15,000. His executor has put in a bill for that amount. The invention has been of vast importance, its principle of propulsion being nothing less than a revolution in steam navigation. The claim was never formally

rejected, but was passed from one committee to another and finally got stuck somewhere in the War Department archives, after passing both Houses of Congress.

Mexico will soon have a number of large smelters, some built with American capital. Recent coal discoveries indicate that in this respect Mexico will become independent of the United States, and can do her own smelting.

Thomas McKee, of New York, is the largest stockholder in the Pennsylvania Plate Glass Company, with \$1,000,000 capital, which will establish works at Irwin among the best equipped in America.

Accounts agree that the new cotton crop in the Southern States will be possibly the largest ever produced. The cotton crop for five years has steadily increased from 6,505,000 bales in 1886-87 to from 7,500,000 to 8,000,000, the estimate for present crop. The total value of last four crops, including cotton seed, was \$1,500,000,000. Value of this year's crop is estimated at \$500,000,000. While cotton has thus been adding so enormously to the South's wealth, corn, wheat, oats, tobacco, rice, sugar, grasses, fruits and vegetables have made great gains. From all over the South bankers write of the "best outlook for farmers since the war."

The British Government is considering the subject of cheaper ocean postage. A member of Parliament, now visiting the postal authorities at Washington, says the White Star Line receives 1 shilling and 9 pence a pound for the mails, and reckoning the average of 40 letters to the pound the writers pay the United States Government 8 shillings and 4 pence for every pound. Although reducing the postage to 1 penny, or 2 cents, may seem to cut off a portion of the postal revenue, the increase in the number of letters written would more than make up the difference.

Good profits are derived from American vessel property in the coasting trade. For example, the Sarah K. Lawrence was built in Maine about three and a half years ago, at a cost of \$65,000. Her owners are 20 in number, and live in Taunton, Mass. She is managed by an agent who has a part interest in her, and also looks after ten other vessels in the coasting trade. She has paid for herself more than twice over since she has been built.

A lake paper expresses regret that two more steamships are to be built at Cleveland and Bay City. The editor says: "The time was when freights were lower, but loads were to be found at some price. There is certainly nothing in the present state of affairs to cause hope for an increase in next season's ore movement, as the tendency is now toward a falling off in shipments."

The United States House of Representatives, on August 28, passed the bill constituting 8 hours a day's work for all laborers and mechanics employed by the general Government.

Charles Gilpin Jr., assignee of the Glamorgan Iron Works, of Philadelphia, has brought suit against William J. McCall, of New York, to recover \$22,000 lost by Charles B. Wigton.

Ottomar Haupt, in the London *Economist*, estimates the annual requirements of fine silver by all countries at 4,640,000 kilos. The production of the world he estimates at 2,992,000 kilos in 1887; 3,424,000 in 1888; and 3,919,000 in 1889. Mr. Haupt closes his letter as follows: "Where is the balance of, say 500,000 kilos to come from, especially if, in reality, an arrangement be arrived at between the American Government and the leading silver mines,

which would limit their production to, say, the average of the last few years? The question asked and considered in this way throws a somewhat strange light on certain discussions published lately on the future of silver in some of your papers, whose pessimist tendencies we over here, with the new turn things have taken, can no longer understand. Certainly, neither I nor many of our writers, agree with the monetary policy the United States have adopted on this occasion, but we find ourselves in presence of an accomplished fact, and there the matter ends." This view is disputed by the London *Economist* editorially, and the opinion is expressed that an increase of production is to be expected, sufficient in a single year to make up the deficiency which Mr. Haupt supposes to exist.

In addition to 15,000,000 pounds of prunes, California, it is expected, will this year raise 45,000,000 pounds of raisins. Last year there were 60,000 acres of vines in bearing, and probably 10,000 acres have been added.

The relative advantages of farming in New York State and in the West form an interesting topic discussed by John W. Dwight, proprietor of the famous farm of 60,000 acres in the Red River Valley, N. Dak. Relative to the cost of farming in the two sections, he said: "It is wholly to the advantage of Dakota, if the measure is made the cost of laying down wheat in New York City. If this cost is figured so as to charge 10 per cent. on the valuation of Dakota land and only 5 per cent. on the valuation of Central New York land, there is still an enormous difference in favor of Dakota. Let me give you some approximate figures: Central New York land is worth on an average \$80 an acre, 5 per cent. on which is \$4. It raises an average of 16 bushels per acre, the cost of getting which to New York City is about 8 cents per bushel, or \$1.28 per acre, making the total cost per acre of putting the wheat product in New York \$5.28. One-half the Northern Pacific land was homesteaded. The balance was probably sold at \$1.25 to \$2.50 per acre, but allowing it at \$5 per acre is an outside figure. Ten per cent. on this is 50 cents an acre. Allowing only 16 bushels to the acre, whereas they get from 20 to 35 bushels, it costs 20 cents per bushel to get the product to New York City through the Erie Canal, or \$3.20. Thus the total cost per acre on this liberal comparison is \$3.70, or a difference in favor of Dakota wheat in New York is \$1.58. The actual figures would show from \$2 to \$3 or even \$4 difference, because some of the great farms of this section were bought at 30 to 50 cents per acre, when the N. P. Railroad was embarrassed and let its land go to pay off bonds." Mr. Dwight makes no discount in the matter of drought, frost and cyclones.

The Compound Lard bill, which passed the House last week, will hardly pass the Senate at this session. It is intended to protect the market against spurious lard, of which cotton seed oil is an important constituent, as the Oleomargarine bill was to prevent imitation butter. It is estimated that the present product of compound lard is 320,000,000 pounds annually.

The Canada steamship line recently established to the West Indies is said to have taken out more manufactured goods than were sent to the same ports all last year.

The original Hudson River tunnel, projected by Col. DeWitt C. Haskins, is advancing under the direction of an English syndicate, which commenced operations about a year ago, and agreed to have work completed by January 1, 1891. The

shield that pioneers through the silt is now half way across the river, and cars drawn by mule power on a railway carry off the material taken out as the tunnel is advanced. Efforts are making to hasten the supply of funds.

It being deemed probable that the Senate will place lumber on the free list Canadian papers recall the fact that Sir John Macdonald several months ago formally announced that a reduction of the American duty would immediately be followed by the repeal of the Canadian export duty on logs.

The long talked of scheme of rendering the Seine navigable as far as Paris for seagoing vessels is at last likely to be carried out. A syndicate of promoters has proposed to undertake the work at an estimated cost of about 200,000,000 francs without a State subvention or guarantee of interest, and has already submitted a list of subscribers of one-third of the capital required.

Labor Day in New York was observed by the closing of the commercial exchanges and nearly all business houses. The turn-out of labor organizations comprised a membership of about 25,000, and good order prevailed in all parts of the city. The Central Labor Union, which paraded on the west side, was most profuse in the display of American flags, while on the east side, where the foreign element most abounds, red flags were a conspicuous feature.

Railways controlled by the Government are not beyond the reach of labor disturbance. The experience of Australia, where all railways are built and operated by the Government, is far from warranting the conclusion that State ownership of the transportation lines is desirable. The combination of labor is there more widespread and effective than in America, so effective, in fact, that the Government is compelled to regard the dictates of these organizations in the management of the railways. A strike is quite as liable to happen under State control as under private control, and its consequences are apt to be more serious, because of the political force at the disposal of the strikers.

The State Factory Inspectors at their meeting at the City Hall in this city elected officers as follows: President, Rufus R. Wade, of Massachusetts; vice-president, John Franey, of New Jersey; secretary, William B. McDonald, of Ohio; treasurer, Isaac S. Mullen, of Massachusetts; assistant secretary, W. S. Simmons, of Connecticut. Mrs. M. B. McEnery, of Pennsylvania, and Robert Barber, of Canada, were also made vice-presidents.

A correspondent in the city of Mexico says the rise in silver means an increased export of American goods to that country, as the rates of exchange will be more favorable. For the same reason native manufacturers are placed at a disadvantage. The writer says: "Foreign trade needs to be cultivated; it requires patience and a willingness to wait till your brands or marks are well introduced, and till these very conservative people begin to have confidence in the Northern goods. In machinery, American manufacturers have got the bulk of trade here; the superiority of American machinery in many lines is recognized. English machinery is also well liked. But the proximity of the United States affords a quick means of securing pieces for repairs and what are called accessories." In paper this is the time to push Spanish-American trade.

The steamship San Bonito, formerly the English ship Kimberley, stranded on the Virginia beach two years ago, was purchased by C. P. Huntington, and has been completely rebuilt at the Newport News

shipyard at a cost of \$300,000. Papers have been issued to her as an American ship. This is the first achievement of the new shipyard at Newport News. This yard cost about \$3,000,000. Mr. Huntington says that if the Subsidy bill passes he proposes building several ships to sail under the American flag, to run between Hampton Roads and Liverpool.

The population of St. Louis, as announced by the Census Bureau, is 460,357, an increase during the census period of 109,839, or 31.34 per cent. The figures for Boston are 446,507, an increase of 83,668, or 23.60 per cent.

The Chinese Consul at San Francisco, F. A. Bec, says that the Chinese population in California has been reduced 11,000 since the passage of the exclusion law, and that the entire Chinese population of the United States does not now exceed 80,000.

The Canadians have made connections with the New York, Ontario and Western Railway, which has been extended to Scranton, in the Wyoming coal basin, and claim to have secured contracts for the transportation of 1,000,000 tons of coal for Canadian consumption.

Mr. Depew says the Knights should not have struck while he was away in Europe; that he should not be censured for not being at his post.

The three great brotherhoods, the Knights of Labor, the Federation of Railway Employees and the Firemen, under the lead of Sargent, are more estranged than ever. In this respect—in their mutual alienation and antagonisms—the Central Railroad strike has wrought irreparable damage to labor organizations.

Oil wells in Peru are yielding copiously, so that the local railways are supplied with crude petroleum and kerosene, said to compare favorably with that imported from the United States, and preparations are making for an extensive export trade to California, Australia, Japan and various points on the Pacific Coast.

Work on railways in Colorado is seriously impeded by the lack of labor. From 5000 to 8000 men are wanted at \$2 per day.

A letter from the Argentine Republic, to which reference was made recently in these columns, spoke of an order for 25,000 plows, said to be in course of execution by the A. B. Farquhar Works, in this country. A gentleman associated with the concern states authoritatively that either the writer must have been misinformed or that a typographical error must have occurred, the facts not being as stated.

J. S. Clarkson, First Assistant Postmaster General, resigned his office to take the presidency of the Judson Pneumatic Railway Company, which applies new principles to railway locomotion and to motive power in cities, and which is now building a railroad in Washington.

Improvements in the new navy are bringing young men to the front in all departments, not the least of which is steam engineering. In the modern ships, in addition to the great triple-expansion main engines, with all their complicated parts, there are dynamos, blowers, steam steerers and auxiliary engines of all kinds and sizes, scattered in widely separated parts of the vessel, and with the small number of engineers carried, a large and intelligent force of machinists is a pressing necessity.

The opening of the Mombasa and Nyanza Railroad, a few days ago, marks the beginning, perhaps, of the important work of opening up East Africa to civilizing influences away from the coast line. Mombasa is on the east coast, a little north of

Zanzibar, and almost directly east of the lower part of Lake Victoria Nyanza. With highways of commerce opened between the navigable parts of the Nile and the lakes, and thence to the east coast, a work which can be accomplished in much less time than was required to develop the interior of this country, Africa, which has already become an important field for pioneer colonists, will soon be settled by large bodies of European emigrants.

H. J. Schulties, the Congressional representative of the Knights of Labor in America, complains bitterly of the indifference of Congress in its treatment of measures introduced by that organization. Respecting the law prohibiting the importation of contract labor, he says the effort is to make it ridiculous. "Last year they returned three persons who came here under contract. Two of these were college professors and a third was a minister of the Gospel, none of whom came within the spirit of the law."

MANUFACTURING.

Iron and Steel.

The appraisers appointed to estimate the losses by the recent fire at the works of the Jefferson Iron Works, at Steubenville, Ohio, have fixed the amount of the damage at \$39,000, which is satisfactory to those interested. The question of rebuilding the nail factory will be decided at the annual meeting of the stockholders to be held on September 6.

George T. Scott, president of the Lawrence Iron and Steel Company, of Ironton, Ohio, advises us that they will soon commence the removal of their plant to Glasgow, Va. When the removal is complete some extensive improvements and additions will be made to the plant.

Hannah Furnace, of the Mahoning Valley Iron Company, at Youngstown, Ohio, has been blown out and will be extensively remodeled. James P. Witherow, of Pittsburgh, has been awarded the contract for the erection of three hot blast stoves, each 18 x 70 feet, of the Kennedy-Cowper design. He will also erect the draft stack, which will be of wrought iron, 6 feet in diameter and 150 feet high. The contract for the fire brick for lining the stoves was awarded to Samuel W. Hay, the Pittsburgh agent for James W. Rose, proprietor of the Sharon Fire Brick Works, at Sharon, Pa.

The plant of the Paige Tube Company, at Warren, Ohio, is being operated to its utmost capacity. At present the firm are filling an order for 60 miles of 8-inch pipe, and are giving employment to 350 men and boys.

The Steubenville Iron and Steel Company, which will move their plant from Alikanana, near Steubenville, to McKeesport, Pa., will be succeeded by a concern for the manufacture of hinges and bolts. A company have been formed in Steubenville to purchase the buildings of the iron works, after being dismantled, for the hinge factory.

Ground has been broken for new malleable iron works at Toledo, Ohio.

An item in this column of a recent issue referred to the fact that owing to the continued increase in their business, the Fred. J. Meyers Mfg. Company, Covington, Ky., were compelled to increase the space used for blacksmith department by the erection of an additional building. This the company inform us is not quite the fact, the addition referred to being erected to give place to the forging department of their architectural iron works.

It is reported that Fayette Brown, of Cleveland, intends to erect a large charcoal blast furnace near Munising, Mich. Mr. Brown owns the old Munising and Bay Furnace tracts of maple timber, comprising over 50,000 acres of hardwood, through which the Duluth, South Shore and Atlantic Railroad now runs, so that a furnace could now be operated on the property under very favorable conditions, both as to the supply of raw materials and the shipment of pig iron to market.

An explosion occurred on the 25th ult., at the chain works of J. C. Schmidt & Co., at York, Pa.

No. 4, the second coke furnace of the Woodstock Iron Company, at Anniston, Ala., is soon to be blown in.

In a published letter, F. Baackes, superintendent of the Salem Wire Nail Company, announces that it has been decided to erect a rod

mill, but that the question whether it will be located at Salem or at Findlay will depend upon the arrangements made for a water supply.

The blast furnaces known as the Cole Furnaces, at Sheffield, Ala., are being prepared for work.

W. F. Mattes, general manager of the West Superior Iron and Steel Company, of Superior, Wis., states that contracts are soon to be placed for a large plate train and reversing engines.

The Washburn & Moen Mfg. Company, of Worcester, Mass., have increased their capital stock from \$1,500,000 to \$2,000,000, by the issue of 5000 shares. It is reported that rights are selling at 21.

The Scranton Steel Company, at Scranton, Pa., have again started up.

The gray iron foundry of Warder, Bushnell & Co., at Springfield, Mass., has started up. The malleable iron foundry has been running for some time.

A new company, known as the Pennsylvania Machinery Company, have been organized in Erie, Pa., for the purpose of manufacturing iron bolts, iron nuts, screws and other small articles of iron and steel.

The Columbia Iron Company, at Lancaster, Pa., have put in an additional heating furnace, and have put up another double puddling furnace.

The Buckeye Malleable Iron Company, of Columbus, Ohio, have increased their capital from \$60,000 to \$100,000.

The additions to the mill of the Johnson Company, at Johnstown, Pa., are nearly completed.

The Jefferson Iron Works, at Steubenville, Ohio, warn the public against purchasing fraudulent certificates of stock.

Lochiel Furnace, near Harrisburg, is to be blown out for repairs.

The Diamond State Iron Company, at Wilmington, Del., is building a large foundry.

Citico Furnace, at Chattanooga, has blown in.

The Pittsburgh Forge and Iron Company are adding to the forge department of their plant in Allegheny, Pa., two hammers, two lathes and a slotting machine.

It is stated that the Peckham Car Wheel Company, of New York City, are trying to secure a location for their plant at McKeesport, Pa.

The annual meeting of the stockholders of the Thomas Iron Company, at which an election of directors will take place, will be held at Hokendauqua, Pa., on Tuesday, the 9th inst.

The rolling mill of the Stewart Iron Company, Limited, at Sharon, Pa., was put in operation on Monday, the 1st inst., to fill a large order for muck iron received from P. L. Kimberly & Co., Limited, of that place.

Machinery.

Among the sales recently made by the Babcock & Wilcox Company, of New York City, through their branch office at Pittsburgh, were the following: Pittsburgh and Birmingham Traction Company, 1000 horse-power; Monongahela City Electric Light Company, 61 horse-power; Tyler Tube and Pipe Company, Washington, Pa., 250 horse-power; Buffalo Electric Traction Company, 1000 horse-power; Vandergrift Building, Pittsburgh, 184 horse-power, and the Glen Echo Passenger Railway, 208 horse-power. The sales through the Pittsburgh office during the first six months of this year aggregate 12,610 horse-power.

The Lloyd-Booth Company, proprietors of the Falcon Foundry and Machine Works, at Youngstown, Ohio, have just completed the shipment of a 20 inch three high muck mill, a 12 inch merchant mill, together with one of their large rotary squeezers and a full equipment of shears, hot saws, &c., to the United States Rolling Steel Company, at Anniston, Ala. The above firm have a large amount of work on hand for different parts of the country and are very busy in all departments.

The Leechburg Foundry and Machine Company, of Pittsburgh, have received a contract for the erection of two hydraulic lifts for converted bottoms for the new steel plant of the Pennsylvania Steel Company, at Sparrow's Point, Md. They are also building a 30 ton fly wheel for the Columbia Rolling Mill Company, of Columbia, Pa. It will have an 18 inch forged steel shaft. The firm are at present building a large amount of hydraulic work for rolling mills.

The Champion Blower and Forge Company are making extensive additions to their works in Lancaster, Pa. The demand for their blacksmith's drills and blowers and forges

shows such a steady increase that they are doubling their foundry capacity, besides making similar additions in other departments. Mr. Kieper, the president of the company, states that their orders to date are considerably ahead of those during all of 1889, both in number and in money value.

The Wainwright Mfg. Company, of Boston, Mass., will probably shut down, as arrangements have been made with the Taunton Locomotive Works, located at Taunton, to manufacture all the specialties of the Wainwright Company, such as heaters, corrugated tubing, steam fittings and filters. The most valuable machinery will be removed to the new place of business.

Aug. Wolf & Co., of Chambersburg, Pa., are adding a foundry and machine shop.

Mitchell & Doughty, of Philadelphia, will erect a machine shop.

It is reported that Akron, Ohio, is to have the new plant of the International Boiler Company.

J. F. Byers is building a machine shop at Ravenna, Ohio.

The contracts for the new plant of the Exeter Machine Company, of Exeter, N. H., have been let.

The G. A. Gray Company, of Cincinnati will remove to Cleveland, Ohio.

Bovaird & Sayfang's boiler shops at Bradford, Pa., were destroyed by fire on the 26th ult.

The Maltby-Henley Company, at Rocky Hill, Conn., will increase their capacity.

M. K. Lewis & Son, of Hastings, Neb., are rebuilding their burned foundry and machine shop.

John A. Cunningham, of Sacramento, Cal., contemplates moving his plant to Seattle, Wash.

It is reported that 6000 acres of land near Saltsburg, Pa., are about to be sold to a syndicate of Pittsburgh capitalists by the Elders Ridge and West Lebanon Coal Company. The land lies along Elders Ridge for a distance of 8 or 9 miles. It is said to be a solid block of coal above water level. The new field is about 3 miles from Saltsburg, on the West Penn road, and is 45 miles from Pittsburgh. Coke ovens are to be erected and Saltsburg expects to boom. The names of the buyers are withheld for the present.

Among newly created corporations in Illinois are the following: Chicago Ornamental Iron Company, at Chicago; to manufacture and sell ornamental iron bars; capital stock, \$15,000; incorporators, Henry C. Frost, John S. Collman and John Meyer. Hanrahan Automatic Refrigerator Car Company, at Chicago; to build and equip refrigerator cars; capital stock, \$500,000; incorporators, William A. Laidlaw, Charles B. Moore and Lorenzo C. Brooks. The Standard Matrix Machine Company, at East St. Louis; to manufacture machines for forming matrices; capital stock, \$1,000,000; incorporators, A. J. Kletzker, H. H. Wernse and George Keller. Robinson, Murdock & Arnold Company, at Chicago; to do a general contracting and building business; capital stock, \$1,000,000; incorporators, David J. Robinson, E. P. Murdock and J. A. Arnold. Freeport Bicycle Mfg. Company, at Freeport; to manufacture bicycles, &c.; capital stock, \$25,000; incorporators, William O. Wright, W. H. Wagner and others. American Copper, Brass and Iron Works, at Chicago; to manufacture brewery and distillery apparatus; capital stock, \$25,000; incorporators, Otto Meinshausen, Major McGregor, Fred Whitfield. Illinois Sears Matrix Machine Company, at Chicago; to manufacture Sears' matrix machines; capital stock, \$300,000; incorporators, O. H. Mann, Henry J. Suhr, C. L. Graham.

The Novelty Electric Supply Mfg. Company, is the title of a recently organized incorporation with a paid up capital of \$100,000, located at 264 West Fourth street, Cincinnati, Ohio, of which Elmer P. Morris is president and manager, and P. B. Chaney secretary and treasurer. At the location named the company occupy a large six story and basement brick and iron structure, 110 x 32 feet, for the purpose of conducting the business of manufacturing all kinds of electrical appliances and supplies chiefly suitable for the equipment of electric light, power plants and electric railways, of which the company own a number of patents, the president of the company enjoying the distinction of having built the first successfully operated electric street railway in the United States, at Appleton, Wis., since which a number of others have been equipped and erected by him. The basement of the company's building is used for japanning department, storage of castings and the motive power plant. The first floor is occupied as a store, shipping and salesroom. The second floor is entirely given up to offices, in which the use of electricity is illustrated in many ways in

facilitating the business of the concern. The third floor is occupied as a general stock room. The fourth floor is termed the magnet wire and armature department. The fifth floor is given over exclusively to the machine shop, in which are located a large number of the finest and most expensive machines and tools obtainable, especially constructed for their purpose. Upon the sixth floor is located the company's drafting rooms and wood pattern shop. The company possess two pole yards, one at Cincinnati and one at Pittsburgh, and although but six weeks in operation, are already compelled to operate their plant nights on account of the press orders coming in. A specialty is also made of repairing dynamos, motors and all mechanical devices entering into the construction of electrical machinery.

The Manville Covering Company, 71 to 75 Second street, Milwaukee, Wis., issue a neat pamphlet describing the Manville steam pipe and boiler covering. The covering they prefer to use is made largely of wool, selected because of its non-conducting properties. The wool is thoroughly mixed by machinery, especially adapted to the purpose, with a non-combustible solution largely composed of fire clay, to make it absolutely secure from charring or burning and at the same time plastic, tough and durable. The compound thus produced is applied directly to the pipes, boiler or other surface in a plastic state, then wound spirally with strong muslin and in a few hours it dries into a compact mass. The fiber of the wool makes a firm, continuous elastic covering and precludes the possibility of the covering cracking. The surface is finished with a fire-proof compound. The manufacturers claim that one great advantage in the use of their covering is that a leak will show through directly at the spot where it occurs. A small portion of the covering can then be removed, the leak repaired and the material easily replaced. In addition to the wool cement covering the company manufacture a covering for brine and ammonia pipes to prevent the formation of ice and do away with the dripping; also a special covering for superheated surfaces; also a sectional covering made of wool felt corrugated paper.

The Dubuque Brass and Metal Company, of Dubuque, Iowa, purpose to build a new plant.

The Des Moines Scale and Mfg. Company, of Des Moines, Iowa, are now in full running order.

W. S. & A. C. Whitman, of Columbus, Ohio, manufacturers of stoves and ranges will move to Glasgow, Va.

The works of the Western Steel Scraper Company, at Mount Pleasant, Iowa, were partially destroyed by fire on the 19th ult.

The Moline Plow Company, at Moline, Ill., are putting up a large addition.

The California Wire Works, at San Francisco, have started their new wire nail mill.

E. Rutz, of Chicago, proposes to build a wire nail factory, at Seattle, Wash.

A. & L. M. McKenna, brass founders and finishers, of Pittsburgh, have voluntarily reduced the hours of labor in their establishment from ten to nine, without any reduction in wages.

Simmons & Barnhill, of Bellaire, Ohio, have fitted up their boiler shop with the necessary machinery and appliances for making converters for steel plants, and are now building a set for the Bellaire Nail Works, of that place, and another for the Wheeling Steel Works, at Benwood, W. Va.

This is the biggest year on record for American travel in Europe, according to the agents of the steamship lines, exceeding even last year, when the Paris Exposition brought over a greater number than any preceding year. The homeward rush is unprecedented, crowding cars and steamships beyond their capacity. Extra ships are put on the routes.

Mr. Mendonca, the Brazilian Envoy on a special mission to the United States, said that Brazil was willing to enter into reciprocity with the United States, and that she would make concessions to this country in return for the removal of the duty on sugar.

Californians are finding fortunes in fruit. There are hundreds of farmers who ran in debt for land and have paid heavy interest on mortgages for three years. The great boom in fruits has not only cleared away their debts, but given them capital for planting more orchards.

The Iron Age

New York, Thursday, September 4, 1890.

DAVID WILLIAMS, - - - PUBLISHER AND PROPRIETOR.
CHAS. KIRCHHOFF, JR., - EDITOR.
GEO. W. COPE, - - - ASSOCIATE EDITOR, CHICAGO.
RICHARD R. WILLIAMS - - - HARDWARE EDITOR.
JOHN S. KING, - - - BUSINESS MANAGER.

Index to Vol. XLV.

The Iron Age Index, January to June, 1890, is now ready, and will be sent to subscribers on application.

A Method for Averting Strikes.

The Illinois Central Railroad Company have taken the initiative in attempting a novel solution of the problem of dealing with their employees. The company have issued circular letters to all their employees inviting them to become stockholders in the company by paying for such stock in installments of \$5, or multiples thereof, at a fair valuation for the stock at the time of purchase. These installments are credited to the employee, and 4 per cent. interest allowed thereon regardless of whether the stock is ever fully paid for or not. As the Illinois Central have always paid good dividends on their stock during the past 30 odd years, their offer means more than would be the case with less successful enterprises. The privilege which the company grant to the employee of drawing 4 per cent. interest on his deposits, and withdrawing those deposits with interest whenever he sees fit, is an act of liberality as wise as it is generous. This privilege removes from the mind of the employee all fear of the ups and downs of exchange values. He knows that he will get a rate of interest as good or better than is paid by a savings bank. As he becomes the owner of a number of shares he is incited to economize the road's resources, knowing that economy practiced by himself and fellow employees will greatly enhance the profits of the road and, therefore, his own.

It has been frequently observed in ordinary factories where a share of the profits is allowed to the workman, that his watchfulness and care, stimulated by the interest given him, leads to a notable saving to the firm. On a railway the opportunities for such economies and care for the company's property should be fully as great, if not greater, than in an ordinary manufactory. Much greater care would naturally be taken to avoid accidents and other sources of losses. Greater care would be taken of the company's machinery, its rolling stock, and of the general condition of the bridges and roadbed, which would in the course of each year greatly lessen the number of accidents. Besides that, traffic would be invited to such a road by the tendency to handle freight with care and dispatch, and passengers would naturally feel more se-

cure in the knowledge that every employee is interested in a money way in the direction of his security.

Strikes should be less frequent on a road adopting the Illinois Central's policy, for the one great element of antagonism, that of a diversity of interests, is lessened, the employees in turn become capitalists and their interests with all the other owners are identical. If the practice becomes general the railway employees, or rather owners, throughout the country would prove an enormous power—in behalf of railway interests. It might become a question if, under the collective management and directed by railway masters, their united votes could not fully offset the adverse granger influence that is now checking railway investment throughout our Northwest. However this might be, such congregated influence would greatly tend to benefit railway interests in many directions that are now not considered because of the conflict of interests, imaginary or real, between employer and employee.

In the case of roads that do not pay regular dividends a certain portion of the net earnings—with the refusal of stock—might not be set aside to pay interest on deposits similar to those invited in the instance named; there are many facts to prove that such an amount given the employees would be more than returned through the economies the employees would practice because of it. Altogether the Illinois Central's movement is in a direction that is calculated to do the railway interests of the country far more benefit than any capitalistic victory over any strike that has ever taken place, because a victory over a strike means sullen and discontented obedience; where, on the other hand, profit-sharing makes every employee keenly alive to his own interests.

Export Prices.

During the prolonged discussion of the tariff in the Senate, persistent efforts have been made to discredit and injure American manufacturers, by holding up to censure the policy of making special prices for the export trade. It has been denounced as an iniquitous proceeding that American producers should be willing to let foreigners have goods at prices lower than those which they ask American consumers to pay. A vast amount of evidence has been presented to prove a fact of which every one in business is fully aware. It is done in many lines and is fully justifiable, not alone on broad grounds of policy, but also as a measure beneficial to American consumers.

It is not a principle followed by American manufacturers alone, but is adopted in Great Britain and on the Continent as an axiom in trade. It is by this means that English and German manufacturers have sought access, and finally obtained control of foreign markets. No market in the world has been subjected to the effects of this policy as much as our own. English and German producers have frequently and deliberately cut their prices for American export orders down to the very lowest

notch—far below the figures for their own home markets. In Germany, the Government, as possessor of the railroads, has co-operated with them by making special freight rates on raw materials and on products. Trade combinations have usually adopted this policy as one of the first principles to be followed out. It was against this practice that one feature, the McKinley administrative bill, was aimed. The creation of our own industries has always protected us against the extortion which follows the capture of a market, as the reward for sacrifices made.

We cannot hope to secure or hold foreign markets unless we follow the example of our competitors. Such a course does not involve any injustice to American consumers. On the contrary, it is of positive benefit to them, because it enables manufacturers to produce more cheaply the goods which they put on the home market. As a rule the price made for export trade is carried as close to cost as it is necessary to go in order to secure the business in foreign markets. If any considerable trade of that character is done, it enables a manufacturer either to run his works full, or to enlarge them so as to produce on a larger scale. This means considerably lowered cost of production, which the sharp competition among home manufacturers soon gives American consumers the benefit of. It means steadier employment to workmen. It means less danger of accumulations of stocks of goods, with all the demoralizing effects upon the whole trade. It means greater immunity from the risk of a short supply, because, at any time, if the more valuable home market demands it, the manufacturer will turn away export orders and throw his whole capacity upon the work of supplying American customers. It is in times of depression at home that the export trade becomes so valuable to a manufacturer, because the causes unfavorably influencing the home market may not be operative in other parts of the world. We believe that an unprejudiced study of the question will lead to the conviction that special export prices are not alone justified but are likely in the long run to be beneficial to American consumers in spite of an apparent discrimination against them. This is true so long as the manufacturers do not sell abroad at less than cost and try to recoup by extorting correspondingly higher prices at home. In staple goods, where the competition is so keen, this is impossible; in specialties it is too unwise a course to be adhered to long.

The lead business of the country is rapidly drifting into the control of a few organizations. The evidences of success of the Lead Trust, the combination of the white lead interests, with two smelting plants and one refinery allied with it, has given encouragement to others. It is true that the grand centralization scheme of the other smelters and refiners fell through completely, but since then the two leading Montana smelting works at Great Falls and St. Helena have combined, and fused with them is the large new refinery which is just being completed at Chicago. Some

of the group of capitalists who are in control of this combination own also the Colorado Smelting Company at Pueblo and possess mining property in that State. Others are very largely identified with mining interests in Montana and the Cœur d'Alene region, in Idaho. Now comes the report that nearly every shotmaker in the country has joined in an association to "economize in general expenses and reduce the cost of production."

Contrary to all expectations, the tariff debate has dragged along for months in the Senate, and it is only now that its end can be clearly foreseen. So far as the metal schedule is concerned it has brought out very few arguments or facts which have not been fully considered in previous debates. It is now a question of only a short time when the tariff bill will be passed. What particular form it will take ultimately it is entirely impossible to predict now. There will be conferences which may or may not seriously modify individual paragraphs. Some of the modifications proposed by the Senate are of the last importance. The House committee may succeed in causing their final rejection. It is likely that an agreement will be speedily reached, and, once adopted by both Houses, the bill will be quickly signed by the President.

A company has been organized recently in this city, under the management of a very well known firm, who have introduced into the rail trade a novel system. It resembles in its general plan the principles underlying the car trusts. The concern in question offers to supply steel rails, with the necessary fastenings, to industrial roads, notably for logging, mining, manufacturing, contractors and plantation track. The plan is to supply the rails for a stated cash payment of 20 to 25 per cent. of the cost, and monthly payments during a period varying from two to five years. Until the purchase has been finally consummated, the title to them remains with the seller. Such a rail trust, if we may so term it, is likely to prove a very convenient matter to those embarking in industrial ventures without the means to purchase for cash, and without the facilities which bond issues afford to those who embark in the construction of chartered railroads.

An important banking decision was rendered at Indianapolis on August 27, by Judge Gresham, in the case of the Commercial Bank of Cincinnati against the Hamilton National Bank of Fort Wayne, which is of general interest to banks and bankers. The case grew out of the failure of Fletcher & Sharp, of Indianapolis. Judge Gresham holds in effect that when one bank owns paper and sends it to another for collection, indorsed "pay for collection," and it passes through a chain of banks thus indorsed, the bank making the collection is held to the responsibility of seeing that the funds reach the original owner of the paper.

The Scotch Iron and Railroad Company have purchased for development, by means of a railroad to the seaboard, 250,000 acres of the finest coal and timber lands in Western Virginia.

CORRESPONDENCE.

Irrigation in Nebraska.

To the Editor: I desire to communicate a few facts to you that will create interest and bear investigation. The contract for the completion of the canal for irrigation and power from a point near Palisade, Neb., to this city, and extending from here to the county line of Red Willow County, was closed Tuesday, August 12, 1890, with C. J. Jones, of Garden City, Kan., who has built in the last ten years 700 miles of irrigation ditches. Mr. Jones agrees to complete the canal and a dam for water power at this city by June 1, 1891, and has given a bond for the faithful performance of the contract. The canal will be some 50 miles in length; the main ditch will be 25 feet wide on the bottom and 4 feet deep and will carry its full capacity of water. The water is taken from the Frenchman River at or near Palisade, Neb. It is estimated that the volume of water in this stream is 300 cubic feet per second. The stream flows in a southeasterly direction and is supplied with water from the subterranean current which underlies the entire State, so that if it should not rain for years the volume of water would not be decreased. The old settlers have never seen this stream dry, or have they ever noticed either an appreciable increase or decrease of the water. There will be more than 30,000 acres of choice land laying under the ditch, all of which can be irrigated and the greater part of which is tributary to this town. Mr. Jones further agrees to build a dam in a canyon one-quarter of a mile from this city where there is a natural reservoir for a lake. From the water in the reservoir there will be produced a water power of 60 feet fall. This power is the absolute property of this city, and will be given in quantities desired to any and all manufacturers desiring to locate at this point. Work has been commenced in earnest and will be pushed rapidly to completion. Culbertson was the headquarters of the cattle interest, their supply stores being located here. Culbertson is situated on the main line of the B. and M. Railroad, from Chicago to Denver, being 250 miles from Lincoln and 240 miles from Denver. The railroad from here to Cheyenne, Wyo., up this Frenchman valley, is now graded and the iron down the greater portion of the way. The Pueblo and Duluth Railroad have made a survey through this place, and our citizens have the written assurance that they will not be slighted. The parties putting in the beet sugar refinery at Grand Island, Neb., have intimated that a manufactory would be built at this city upon the completion of the canal. Yours respectfully,

H. BLUM.

CULBERTSON, NEB., August 18, 1890.

The next of the new ships of the navy to be officially tried is the steel cruiser Newark, the sister ship to the Baltimore and Philadelphia, that has been built by the Cramps. The Newark's test is not one of speed, but of horse-power, her requirements providing a development of 8500 horses. The engines by which this is to be accomplished were designed by Horace See. They are of the horizontal, triple expansion type, the cylinders being of 34, 52 and 76 inches diameter, respectively. A feature in these designs is the arrangement of the piston valves, which are driven almost entirely by the improved Marshall valve gearing. The Newark's displacement is 4083 tons, being almost the same as that of the Baltimore and Philadelphia. Her hull was designed by the Bureau of Construction, so that she may be said to combine the best qualities,

both as to engines and hull, which have thus far been designed for American war ships.

Obituary.

THOMAS G. BOYLE.

On Saturday of last week the business community of Pittsburgh was shocked by the announcement that Thomas G. Boyle, senior member of the firm of Thomas G. Boyle & Co., iron and steel brokers, of that city, had met his death by drowning at Brigantine Beach. It seems that Mr. Boyle had been sojourning at Creason Springs, Pa., for some days, when it became necessary for him to make a business trip to the South. On his way there he concluded to stop over at Brigantine Beach to visit his father. He arrived there on Friday afternoon, and from a friend learned that his father was in bathing. As his coming was intended as a surprise to his father he determined to make it more so, and for this purpose hired a bathing suit and was swimming out in the direction of his father when he suddenly made a loud cry and sunk beneath the waves. He had evidently been seized with cramps, as his body did not come to the surface after going down. In addition to carrying on a general brokerage business in iron and steel, Mr. Boyle was vice-chairman of the firm of Gorpon, Strobel & Laurean, Limited, engineers and contractors, of Philadelphia. He was also treasurer of the John Porter Company, fire brick manufacturers at New Cumberland, W. Va. Mr. Boyle was about 30 years of age and leaves a large circle of friends who will sincerely regret his death.

A report has been circulated recently, particularly in newspapers of the West, in relation to a breakdown of the windlass on the United States cruiser San Francisco, while lying off the coast of California. The story is to the effect that, owing to the inexperience of the men in handling the new apparatus, the anchor broke loose from the cable and demolished the gear, and that the windlass being a patented one, a new one could not be put in until the order had been sent East and another shipped to San Francisco. The rumored break, however, proved to be only a very slight one and was easily repaired, but it unquestionably showed a weakness in the windlass. The windlass causing the trouble was not a patented one as reported, neither was it made by the American Ship Windlass Company, of Providence. It was furnished by the Union Iron Works who examined the break and made a report to Captain Goodall of the San Francisco.

A new form of torpedo, which has been named the Victoria, is now being manufactured by Heenan & Froude, of Aston, and promises to be an important improvement on the torpedoes hitherto in use. The advantages claimed for the invention are that it affords means by which a torpedo bearing a general resemblance to the Whitehead can be discharged from any selected spot of the coast, or from an anchored cage at some distance from the coast, without any preparation which will occupy more than an hour or two, and hence, without any knowledge on the part of an enemy of the place or direction from which he may be exposed to attack. The specimen now in the course of construction will be driven by a propeller of four blades, worked by a store of compressed air, which is contained in the body of the machine; and in addition to the propeller, it is provided with a dorsal fin and with two rudders, one vertical and the other horizontal.

Washington News.

(From Our Regular Correspondent.)

WASHINGTON, D. C., September 2, 1890.

Before the next issue of *The Iron Age* reaches its readers the Tariff bill, over which there has been such a long period of partisan struggle as a weapon for the defeat of another measure, will have passed the Senate, and will be in the preliminary stages of nonconcurrency and conference between the two Houses of Congress. It has been literally a two months' parliamentary campaign of argument, in which over 3,000,000 of words have been sacrificed in the battles of conflicting views. This tremendous slaughter of "the King's English" lies embalmed in 1500 pages of the *Congressional Record*. Here the student of the wars of the tariff champions in Congress will be able to contemplate the wasteful energy of one of the most remarkable conflicts in the arena of parliamentary debate. Had the contest been over the tariff, disassociated from another issue, the question would have been settled without such wearying effort, but a radical innovation upon the existing organic forms of the elective system of the Government drew upon it the hostile movements of the minority, in order to destroy the immediate force of the obnoxious measure in the election of the *personnel* of the Fifty-second Congress. A truce, a parley, a compromise and an agreement between the contending forces of the Senate made the passage of the Tariff bill a surety, with the Election bill an equal certainty, but after the time for which it was originally framed to apply.

Since the final agreement upon the programme under which the Senate has been operating during the past week the debate has made material progress down the long list of paragraphs and items of the tariff schedules. The wool provisions having been finished, it is now proposed to pass over items upon which there is no special issue to be made, and to discuss mainly such as sugar and reciprocity. The remaining five days of the debate will therefore be likely to be more interesting than the strained efforts which characterized the dilatory purposes of the talk of the past.

There is every evidence that the reciprocity movement will take definite shape in concurrent action by the two Houses of Congress. It is now generally conceded to be a feasible scheme in certain directions, but the probable surrender of \$50,000,000 of revenue with increasing demands upon the receipts is a phase of the question which must be carefully looked after. The opponents in the House are beginning to become more reconciled to the scheme, and will give it considerable debate in their body, pending the action of the Conference Committees on other features of the bill.

The Navy Department is just now engaged in a vast amount of work, in the construction and engineering bureaus in carrying on the vessels now under way and preparing for the new ones authorized by the present Congress. The great armored battle ship *Maine*, now building at the Brooklyn Navy Yard, is pushing ahead rapidly. It is reported at the department that she will be ready to launch in November. The work has been pushed with great vigor, which is a great credit to the excellent administration of this branch of naval duty. The friends of building ships of war in Government yards expect to gain an invincible argument in support of their policy by the construction of the *Maine*. The armor is 12 inches thick, faced on the outside with steel and backed on wood, with enormous bolts

penetrating a sufficient distance into the back surface.

The *Texas*, the other armored ship being built at Norfolk, Va., is progressing slowly. The facilities are not as satisfactory as at New York and, therefore, the work is surrounded by some difficulties. It will be remembered that this is the vessel for which Secretary Whitney purchased plans from a noted English shipbuilding firm. In preparing for building this English modeled armored ship, it was discovered by our own naval experts that she would not float free of the water, her gun deck being 18 inches under water. The keel, however, was laid and work commenced. The naval experts say that she can be safely constructed up to a certain point on her English model, but after that must be radically changed. The plans have been matured for this, but the ship, after expending \$3,000,000, will not only not be first-class, but will be a warning to future Secretaries of the Navy that Anglophobia is a dangerous disease when applied to building war ships. In every sense the American naval officers and experts have conclusively demonstrated that they can beat the world in designs, models, construction, machinery, armament, equipment, seaworthiness and speed. The *Texas*, however, is regarded as a good investment, if for nothing more than to puncture and explode the idea that any foreign ship can be superior to home production. In naval matters it will be demonstrated within two or three years, by work now being prepared quietly, that England, France, Germany, the great warship building countries of the globe, are not even in sight of the United States in the same line.

Conciliation in London.

On February 6, of this year, a committee of the London Chamber of Commerce presented a report, in which the following proposals were submitted:

Your committee has endeavored to devise some practical methods for carrying out the scheme contained in the Interim Report provisionally adopted by the Council on December 12.

The committee offers the following suggestions:

1. That a permanent body be constituted, to be called "The London Conciliation Board," which shall be affiliated to the London Chamber of Commerce, and that its composition shall be as follows:

(a) Twelve members, representing capital or employers, to be elected by the council of the chamber.

(b) Twelve members representing labor, to be elected by the employed.

(c) To these shall be added representatives from the separate Trade Conciliation Committees as hereinafter referred to.

(d) The body thus constituted shall add to their number six other members, who, from their position, authority or experience, may be useful in promoting the objects of the London Conciliation Board, three to be appointed by the labor representatives on the board, and three by the representatives of capital.

(e) Four members, viz., the Lord Mayor of London, or some member of the Corporation to be nominated by him, the Chairman of the London County Council, or some member of the Council to be nominated by him, two representatives of London labor organizations, to be selected by the labor representatives on the board.

The elections shall take place every three years, and the first election shall take place on the

2. The duties of the London Conciliation Board shall be as follows:

(a) To promote amicable methods of settling labor disputes and the prevention of

strikes and lock-outs generally, and also especially in the following methods:

1. They shall, in the first instance, invite both parties to the dispute to a friendly conference with each other, offering the rooms of the Chamber of Commerce as a convenient place of meeting. Members of the board can be present at this conference, or otherwise, at the pleasure of the disputants.

2. In the event of the disputants not being able to arrive at a settlement between themselves, they shall be invited to lay their respective cases before the board with a view to receiving their advice, mediation or assistance. Or, should the disputants prefer it, the board would assist them in selecting arbitrators, to whom the questions at issue might be submitted for decision.

3. The utmost efforts of the board shall, in the meantime, and in all cases, be exerted to prevent, if possible, the occurrence or continuance of a strike or lock-out until after all attempts at conciliation shall have been exhausted.

The London Conciliation Board shall not constitute itself a body of arbitrators, except at the express desire of both parties to a dispute, to be signified in writing, but shall in preference, should other methods of conciliation fail, offer to assist the disputants in the selection of arbitrators chosen either from its own body or otherwise. Any dispute coming before the board shall, in the first instance, be referred to a conciliation committee of the particular trade to which the disputants belong, should such a committee have been formed and affiliated to the chamber.

(b) To collect information as to the wages paid and other conditions of labor prevailing in other places where trade or industries similar to those of London are carried on, and especially as regards localities either in the United Kingdom or abroad where there is competition with the trade of London. Such information shall be especially placed at the disposal of any disputants who may seek the assistance of the London Conciliation Board.

3. The separate Trade Conciliation Committees shall be composed of equal numbers of employers and employed.

Each trade shall elect its own representatives, employers and employed voting separately for the election of their respective representatives. The number of members and the general rules of procedure shall be determined by each particular trade, subject to the approval of the London Conciliation Board.

The Trade Conciliation Committee shall be affiliated to the London Chamber of Commerce, and shall be represented upon the London Conciliation Board. Any Trade Conciliation Committee constituted as above, representing a body or trade in the metropolitan districts of more than 1000 individuals, shall send two representatives to sit on the London Conciliation Board, one being an employer and the other an operative workman, each to be separately elected by employers and employed respectively. In the case of Trade Conciliation Committees representing bodies or trades in the metropolitan districts smaller in number than 1000 individuals, two or more such committees may unite together to elect joint representatives to the London Conciliation Board.

It shall be the duty of the Trade Conciliation Committee to discuss matters of contention in their respective trades, to endeavor amicably to arrange the same and in general to promote the interests of their trade by discussion and mutual agreement. In the event of their not being able to arrange any particular dispute, they will refer the same to the London Conciliation Board, and in the meantime use their most strenuous endeavors to prevent any strike or lockout until after

the London Conciliation Board shall have exhausted all reasonable means of settlement.

They may from time to time consider and report to the London Conciliation Board upon any matter affecting the interests of the particular trade upon which it may be thought desirable to employ the action or influence of the London Chamber of Commerce as a body.

4. The London Chamber of Commerce places its rooms at the disposition of the London Conciliation Board and of the Trade Conciliation Committees for holding their meetings. Any alterations in the rules and regulations of these bodies which may be from time to time proposed shall be submitted for approval to the Council of the Chamber.

5. The above regulations shall be subject to by-laws, to be specially framed for the purpose, and which shall be open to amendment as required from time to time, on agreement between the Council of the Chamber of Commerce and the London Conciliation Board.

The Ottumwa Coal Palace.

Ottumwa has been called the "Lowell of Iowa," because of its great manufacturing interests. These manufacturing interests are directly due to the great coal beds in which Ottumwa is situated. The city is an old one—as Western cities go—dating its history from 1840 or thereabouts, and preserving in its local annals the near-by traditions of the great aboriginal tribes who once made this their hunting grounds. The town has a population of some 17,000, and is just now growing with that surprising rapidity which seems to be the distinguishing characteristic of the West. The visitor sees on every hand new business blocks going up; a great force of men are busy putting down miles of brick paving, the sixth railroad has just been added to the lines of rail communication leading into the city, and in the midst of all, surrounded by its wonderful "Sunken Park," and adjacent to the superb new union depot of the Chicago, Burlington and Quincy Road, towers the massive proportions of the Coal Palace itself. At Ottumwa all the roads center upon the river front, back of which the city rises in lordly terraces to the summit of the sweeping bluffs. The palace is in the very heart of the city.

The great structure covers almost a block of ground, and is 200 feet in the clear to its highest central tower. It has those massive harmoniously conceived graces of architecture which rescue it from all triviality. Its name is not a misnomer—it is a palace in all its architectural details. The cost of the building will be between \$28,000 and \$30,000. The architecture is a compromise between the Gothic and the Byzantine. The building is two stories in height, the first being about 20 feet to the ceiling, the other reaching to the top of the structure, varying from 40 to 60 feet. The main hall, with the balconies ascending direct from the stage, will give the building an auditorium with a seating capacity of from 6000 to 8000. On either side of the main room or nave of the building are the spaces above and below for the exhibits of the surrounding counties and from abroad.

The walls are composed of blocks of bituminous coal, laid in red mortar, veneered over a solid sheeting of plank. The ten counties which form the coal league—though the citizens of Ottumwa are building the palace—produce over 3,000,000 tons of coal a year, and offer to the manufacturer and the artisan a marvelously cheap fuel, costing for steam production but 37 cents per ton in Ottumwa. There will be three special

features which the palace will claim as "all its own"—the mine, the garden and the waterfall. The palace is built on 300 piles, driven in what is known as the "Sunken Park." Years ago the Des Moines River plunged into mighty torrents over the spot the palace now adorns. The "Q." came into the city, and finding no better right of way, pushed out on trestle work and embankment across the bend in the river. This changed the course of the stream, and soon a slough was encased, which was reclaimed. It has never been filled up completely, but has been adorned and beautified, and thus has come to be known as the "Sunken Park." That part of it beneath the palace comes in play in a most fortunate manner as a miniature coal mine, which is to be one of the features of the palace, and the excavation is most admirably adapted to it. Into the mine a shaft will lead from the main tower, over 150 feet above. The tower is over 40 feet square, and will be reached by two elevators in the semi-circular towers toward the front, or by flight of stairs in either of the other semi-circular towers at the rear corners. From this point the sightseer will enter a car just as in a regular mine, when he will be lowered through a dark and forboding shaft into the "sunken park," where the mules and miners with their lamps and picks, and the coal in large veins, can be seen with as much vividness as if in any of the mines near the city. The sunken garden will itself be one of the features of the palace. The waterfall is probably the largest ever seen in such a building. It occupies a space in the rear, and will be a sheet of water 20 feet wide, falling over an artificial precipice 40 feet high. Three hundred electric lights, artistically arranged in the rear will cause a thousand rainbows to chase each other with exquisite effect; 1,500,000 gallons of water will be the daily supply. The Coal Palace, which opens September 16 and closes October 11, will be an agricultural, mechanical and industrial display; but the departments of fine arts, science, ethnology, &c., will be by no means neglected.

The applications for floor space that have been received for the Exhibition of the Charitable Mechanic Association in Boston this fall already number nearly 600, insuring a more complete exhibition than any previously held by this association. The officers are now busy with the work of assigning locations. The Granular Metal Company, brass and iron castings and granular metals; H. F. Jenks, Pawtucket, drilling and tapping machines, and the Stereo-Relief Company, ceiling and wall decorations, will have exhibits. The art galleries will receive 125 pictures from New York.

The cost of running the fast European steamers and all other facts relating thereto, are ordinarily obtained with difficulty, no one being authorized to impart the information. A local New York reporter had a very satisfactory interview with the agent of the Hamburg-American line, who dissipated, as well as he was able, the mystery that had enshrouded the problem. A midsummer trip of the magnificent *Normannia* was the theme of his calculation. The *Normannia* is not quite as big as the twin-screw boats of the White Star and Inman lines, but her expense account, owing to the greater length of her voyage, is just as formidable. The cost of running her from her dock in Hoboken to her dock in Hamburg is about the same as the cost of running the *City of Paris* from New York to Liverpool. When the *Normannia* starts on an eastward voyage she carries nearly 3000 tons of coal in her bunkers, and it costs about

\$3.50 a ton. The stokers daily shovel into her furnaces between 250 and 300 tons. The expenditure for coal runs just short of \$1000 a day, or nearly \$8000 for the voyage. All expenses included, it may be said that one trip of the *Normannia* costs the Hamburg-American line not less than \$25,000. The receipts from all classes of passengers on a good midsummer trip are over \$50,000. Usually the *Normannia* carries 800 tons of freight, which, at the transportation rate of about \$10 a ton, amounts to \$8000.

Relative Cost of British and American Ships.

The experience of the Pacific Mail Company in having their fast ocean steamer *China* built in Great Britain instead of the United States has not been such as will tend to create a rush to the Old World for vessels, says the *San Francisco Chronicle*. The *China* made fast time across the Pacific Ocean, it is true, beating the *Oceanic* a little, but she did it at such an expense as has caused no little dissatisfaction to her owners. She carries a few more passengers than the *Peking*, a 15 year old American steamer, but the latter can carry about 800 tons more freight, which is quite an item in figuring up the profit and loss of a trip. While the *City of Peking*, with 4000 tons of freight on board and three boilers at work, makes slightly slower speed, she burns but 47 or 48 tons of coal daily. The *China*, with but 3600 tons and with a few more passengers than the *Peking*, burns 80 tons a day of coal and 120 when all six of her boilers are used. This comparison, it must be remembered, is made between a British built ship whose construction had the advantage of all modern inventions and discoveries and a vessel built in Roach's yard 15 years ago. And the new vessel, burning nearly twice as much coal and requiring a much larger crew, goes to Victoria in 48 hours against the *Peking's* 53, the latter being only five hours slower. The *China's* engines and boilers are represented to be very fine, but she eats up the fuel. She cost something less than *Cramp* offered to build her for, but he now says he is willing to build as fast a vessel for the price and guarantee that she will do the same work in the same time with a much less cost of fuel. In the matter of appliances other than the engines and boilers the American-built vessel has very much the advantage, doing the same work with much less outlay both for steam and labor. A case in point is the steam winch for hoisting and lowering freight. The American builders put in a winch that hoists loads with less expenditure and lets them down with none at all. The British-built vessel is still supplied with the antiquated winch of years gone by, which puffs and struggles and wastes a deal of steam in hoisting a load, and expends as much more steam in letting it down, whereas the American winch is so built that the operator stands with his foot on a friction brake and lowers a load without recourse to steam.

The owners of the *China* already realize that the money saved on the first cost of the vessel by sending abroad to have her built will go but a short way in paying the increased cost of running her. The wages of the big crew required to handle her, compared with those of the crew on such a vessel as the *City of Peking*, and the enormous increase over the latter in the amount of coal burned, will eat up the money saved in construction in a short time. A few more such experiments as this would do much toward hastening a boom in American shipbuilding.

The Pennsylvania Steel Company are experimenting with an ingot pusher of special design.

TRADE REPORT.

Chicago.

(By Telegraph.)

Office of *The Iron Age*, 59 Dearborn street, CHICAGO, September 3, 1890.

The condition of the Iron trade generally continues most excellent. Sales are far ahead of last year in every line. The railroads have latterly become heavy purchasers, and business with them is on the increase. There is, however, no one direction in which the consumption of Iron overshadows all others. A peculiarity of the situation at present is the universality of the demand; yet prices do not advance as much as might be expected under the circumstances. Here and there slight upward movement is perceptible, but it appears as if most sellers are afraid to ask more for fear that they might have to retrace their steps very soon. This in itself may make prices go up, as it is always the unexpected that happens.

Pig Iron.—In Pig Iron the week has been uneventful. A few options that were about to expire were closed by buyers on Monday at current prices, and some inquiry is noted for extended deliveries, but in general the local Pig Iron houses have had but a light trade. They are not pushing sales with much vigor, as the furnaces are well supplied with orders and can easily endure a limited season of quietness. Some small Southern makers have made slight concessions, but this is not new, as it has been referred to in previous reports, and seems to have no influence on the market for leading brands. Prices may therefore be regarded as fairly firm and unchanged. Quotations are as follows, cash, f.o.b. Chicago:

Lake Superior Charcoal.....	\$20.00 @	\$20.50
Local Coke Foundry, No. 1.....	16.50 @	17.50
Local Coke Foundry, No. 2.....	16.00 @	17.00
Local Coke Foundry, No. 3.....	15.50 @	16.00
Bay View Scotch.....	18.00 @	18.50
Am. Scotch (Strong Soft), No. 1.....	19.25 @	20.25
Jackson County, Soft and Silvery, No. 1.....	18.25 @	18.50
Southern Coke, No. 1.....	16.50 @	17.00
Southern Coke, No. 2.....	16.00 @	16.50
Southern Coke, No. 3.....	15.50 @	16.00
Southern, No. 1, Soft.....	16.00 @	16.50
Southern, No. 2, Soft.....	15.00 @	15.50
Southern Gray Forge.....	15.00 @	15.50
Southern Mottled.....	14.00 @	14.50
Tennessee Charcoal, No. 1.....	19.00 @	19.50
Missouri Charcoal, No. 1.....	18.50 @	19.00
Alabama Car Wheel.....	22.50 @	24.00

Bar Iron.—Bar Iron is stiff, but there is hardly as much inquiry as during the past month. Several large orders were placed for Car Iron and general specifications, and the mills are well supplied with work, so that a very confident tone prevails among sellers. Youngstown mills quote 1.75¢, half extras, at mill, and this is claimed to be bottom. All consumers of Bars are so busy and using so much more Iron than usual, that no long spell of dullness is looked for. In fact several large concerns are known to be in need of Iron which they must buy soon, as they have deferred making contracts in the belief that prices must recede. There is now little chance of that in the near future. Local mills quote 1.85¢ @ 1.90¢, and have but little room for further orders. Jobbers were never so busy as now, and can hardly get Iron fast enough. They quote 2.10¢ @ 2.20¢, full extras, and make 2¢ their bottom rate to very best trade.

Structural Iron.—The carpenters' strike, inaugurated on Monday, will interfere seriously with this branch of the trade if it continues any considerable time, but hopes are entertained that it will be speedily settled. New and important contracts are pending which may be unfavorably affected. The mills are so crowded with work, however, that a brief tie up here

would give them a chance to catch up elsewhere. Prices are firm. The following quotations prevail on carload lots, f.o.b.: Angles, 2.35¢ @ 2.40¢; Tees, 2.80¢ @ 2.90¢; Beams, 3.20¢; Universal Plates, 2.45¢ @ 2.55¢; Sheared Plates, Iron, 2.50¢ @ 2.60¢; Steel, 2.60¢ @ 2.70¢; Car Truck Channels, 2.60¢. Beams sell from store in small lots at 3.70¢, but Angles and Tees at 10¢ @ 15¢ @ 100 above carload prices.

Plates, &c.—Dealers report their business about as heavy as they can well take care of. Sales this year are far in excess of last year, and still prospects are bright for continued good trade. Mills are badly crowded, especially on iron plates, and are falling in arrears on deliveries. Tubes were slightly changed in price last week, but not so as to affect the retail trade. We quote: Nos. 10 to 14 Iron Sheets, 2.90¢ @ 3¢; do., Steel, 3¢ @ 3.25¢; Tank Iron, 2.65¢ @ 2.75¢; Steel, 2.85¢ @ 2.95¢; Shell Steel, 3.25¢; Flange Steel, 3.50¢; Fire Box Steel, 4.50¢; Rivets, 4¢ @ 4.25¢; Norway Rivets, 40 % off; Tubes, 1½ inch, and less, 40 % off; 2 to 4½ inch, 50 % off; larger, 52½ % off.

Sheet Iron.—The situation is unchanged. The mills quote No. 27 Common Black at 3.10¢ at mill and are crowded with work, while jobbers sell from store at 3.40¢ and 3.30¢. The latter say that the demand is very large but the competition among dealers to secure orders has led to the concessions quoted. Galvanized Iron is in strong request and orders are coming here from quarters usually drawing supplies elsewhere. Manufacturers' agents advanced prices 2½ % on Monday. Jobbers, however, still quote 60 % and 10 % on Juniata, and even shade that price sometimes.

Merchant Steel.—Inquiries are still coming in from large consumers, showing that they have not all bought their season's supply. They are not able now to do as well as they could have done a month or so since. Sellers are finding less difficulty in getting advanced prices. Some of the leading houses now asking our outside quotations for large lots. Very few will sell any considerable quantity at the inside figures. Prices are as follows: Tire Steel, 2.40¢ @ 2.50¢ rates; Open Hearth Spring and Machinery, 2.50¢ @ 2.75¢; Bessemer Machinery, 2.30¢ @ 2.40¢; Crucible Spring, 3.50¢; Tool Steel, 7¢ and upward; Crucible Sheets, 7¢, 8¢ and 10¢.

Steel Rails.—Steel rails are unchanged at \$33.50 with no large transactions to report. Mills are all running regularly, the railroad troubles having been settled. Spikes are higher and \$2.25 is now asked. Iron Splice Bars are quoted 2¢ @ 2.10¢, and Hexagon Nut Bolts, 3.05¢ @ 3.15¢.

Old Iron Rails.—Old Rails are quiet at this point. Several hundred tons were sold at close to \$25, Minneapolis, to go South, and another lot of 500 tons brought \$27, East St. Louis. Old Steel Rails are in moderate demand at \$18.50 @ \$22, according to length. Old Car Wheels are rather quiet, with offerings at \$19.25.

Scrap.—The demand is strong for high grade, but Cast and low grade are dull. Selling prices are: No. 1 Railroad, \$21.50 @ \$22; No. 1 Forge, \$21; Axles, \$26.50; Half Mill, \$16.50; Stove Plate, \$10.25; Wrought Turnings, \$13; Axle Turnings, \$13.50; Horse Shoes, \$19.50; Car Axles, \$25.50; Mixed Steel, \$14.25; Coil Steel, \$18; Leaf Steel, \$19; Tire Steel, \$20.

Pig Lead.—Dealers report an actual scarcity and state that it is difficult to see where manufacturers will find the Lead to supply early requirements. Lead is advancing abroad as well as in our own markets. Sales here aggregated 500 tons during the week at 4.47¢ @ 4.60¢, with 4.65¢ asked at the close.

Winne & Jackman, 228 Lake street, Chicago, are distributing a card on which are printed in colors reduced copies of labels used on the various grades of Tool Steel manufactured by Howe, Brown & Co., Limited, for whom they are general Western agents. The different letters and colors used on these labels indicate suitable tempers adapted to particular purposes. The colors used are light brown, yellow, light red, dark red, purple, blue, green and black. The card on which they are printed is of large size and intended to be hung on a wall.

Chattanooga.

Office of *The Iron Age*, Carter and 9th Sts., CHATTANOOGA, September 1, 1890.

Pig Iron.—Notwithstanding the reports from the East that the Pig Iron market has lately lapsed into a demoralized condition, there is not the least symptom of it in the producing districts of the South. Prices are ranging to-day fully up to the standard that has been prevailing for the last month or six weeks for all grades except No. 1 Foundry, which is a little stiffer, and the furnaces are realizing a difference of between 75¢ and \$1 between the price of No. 1 and No. 2. A number of round lots have changed hands at the price of \$13.25 @ \$13.50 for choice brands of No. 1. This price is not obtained for all makes, but \$13 at furnace for No. 1 appears to be the lowest limit. A number of the furnaces have been offered present ruling prices for their entire product for the balance of the year, but in most cases these offers have been declined. While it appears to be the general opinion that prices will remain about the same the balance of this year, there are not those wanting who are of the opinion that prices will advance a little in the course of a few weeks. Judging from the inquiries and the demand from consumers there seems to be no reason to doubt that the producers will be able to dispose of their entire product without trouble. There has been no piling up to amount to anything in the furnace yards, but everything seems to be moving along very smoothly, excepting that some of the consumers are complaining to the furnaces of slow shipments. Many of the stacks are very much behind hand with their orders for No. 1 Foundry and will not make sales for immediate delivery at any price. No. 2 Foundry is in good demand. Nearly all of the furnaces that have been under repairs are now going in with sales ahead for the next month or six weeks. Freight rates are now quite tranquil, showing no disposition to vary from their past figures, excepting on rates to some few points, which are necessarily altered to equalize shipments from other points. We are now quoting at the furnace medium grades in round lots at \$13 for No. 1, \$12 for No. 2, \$11.50 for No. 3. Gray Forge ranges from \$10.50 to \$11.

Cleveland.

CLEVELAND, September 1, 1890.

Iron Ore.—The market possesses many features of interest. The demand for all grades of Ore is constant and emphatic. Bessemer averaging 63 % are held at \$5.75, f.o.b. vessels lower lake ports, and are selling quite freely at that figure. All 60 % Bessemer Ores are selling for about \$5.60, same delivery. The demand during the past ten days has made apparent the fact that a very considerable quantity of desirable Bessemer Ore is still to be had at prices not quite as high, perhaps, as early season quotations, but still above the proportionate cost of non-Bessemer. During the past week the receipts of new Ore at Cleveland have exceeded 75,000 tons, while about 50,000 tons have gone forward to the furnaces. Lake freights are unchanged, \$1 being the prevailing

rate from all upper lake ports to Cleveland, Lorain, Fairport, Ashtabula, Erie and Buffalo.

Pig Iron.—The demand for Gray Forge and Neutral Mill Irons is steadily increasing, and Lake Superior Charcoals are eagerly inquired for. Indeed the general tone of the market seems improved in every way. Although there have been reported cutting of prices to meet certain emergencies, quotations are firmer and less susceptible of outside influences than for several weeks past. Local dealers, with scarcely an exception, report that their early summer contracts are still unfilled, and that they have work enough on hand to keep them engaged for several weeks to come. Local furnacemen are still confident of better prices in the near future. Lake Superior Charcoals at \$20.50 @ \$21 and Gray Forge Irons at \$15.50 seem in the best demand.

Manufactured Iron.—Common Bar continues to improve in demand at 1.75¢ @ 1.80¢. Sheets are scarce and high.

Scrap Iron.—Prices are somewhat improved. No. 1 Railroad Wrought at \$21.50 @ \$22 is in good demand, as are also Wrought Turnings at \$14 @ \$14.50; Old Iron Rails at \$27 @ \$27.50; Cast Scrap at \$15 @ \$15.50; Old Car Wheels, \$18 @ \$18.50; Cast Borings at \$12 @ \$12.50.

Old Rails.—Old Americans are selling freely at \$26 @ \$26.50.

(By Telegraph.)

Iron ore agents report sales of Bessemer's averaging about 62% in Iron at \$5.65 to \$5.75. The business that has been done in Bar Bessemer during the past month has nearly depleted the visible supply and prices are somewhat firmer. The Bar Iron market is also improved both as to the volume of business done and the prices obtained.

St. Louis.

Office of The Iron Age, 214 N. Sixth st.,
St. Louis, September 1, 1890.

Pig Iron.—The demand shows signs of improvement, particularly as regards Mill Irons. Offerings of No. 1 Foundry are very limited and to secure any large amount full price is required, which means \$16.25, f.o.b. cars at St. Louis. Consumption keeps up remarkably, when the immense production is taken into consideration, and many of the leading furnaces have less than a week's production on the banks, and are sold ahead in some instances as much as three months. The cool weather which we are now experiencing will tend to increase trade in all lines, and it seems more than probable that Pig Iron will come in for a share of the prosperity. Regarding prices there is some little complaint, but these are traceable to sales of Warrant Iron spoken of in last week's report, and, as then stated, as soon as this Iron is disposed of the sale of legitimate Irons will be considerably improved. Prices during the week under review have been fairly steady except in the cases just mentioned, and the following quotations indicate the general condition of the market, and are for cash, f.o.b., St. Louis:

Southern Coke, No. 1 Foundry,	\$16.00 @	\$16.25
Southern Coke, No. 2 Foundry,	15.00 @	15.25
Southern Coke, No. 3 Foundry,	14.50 @	14.75
Gray Forge.....	14.00 @	14.35
Southern Charcoal, No. 1 Foundry.....	18.00 @	18.50
Southern Charcoal, No. 2 Foundry.....	17.00 @	17.50
Missouri Charcoal, No. 1 Foundry.....	17.00 @	17.50
Missouri Charcoal, No. 2 Foundry.....	16.25 @	16.75
Ohio Softeners.....	18.00 @	19.00

Bar Iron.—There is no special change to note in this department. Jobbers report their order books as being uncomfortably full, as mills are unable to ship with the required promptness. Lots from store command 2¢ @ 2.10¢ mill; mill price is from 1.90¢ @ 1.95¢.

Barb Wire.—Mills have been unusually busy during the past week. The reason for this activity is on account of the restoration of freight rates to Texas points. A number of large orders having been booked at the cut rate, it was necessary to have the same on cars by the 30th, as this was the last day of the low rate; hence the unusual activity. Mills will now turn their attention to the Western trade, which they have neglected somewhat during the past month, and a large trade is anticipated from that section during the month of September. Prices are firmly adhered to as follows: Painted, 3.05¢; Galvanized, 3.65¢. Carload lots 10¢ per cwt. less than above prices.

Wire Nails.—The demand for Wire Nails continues to be heavy, and prices are quoted with considerable firmness at 2.65¢ for carload lots, f.o.b. St. Louis. Less than carload lots are quoted from 2.70¢ to 2.75¢.

Rogers, Brown & Meacham are representatives of the new Vanderbilt furnace of Birmingham, Ala.

The Ludlow-Taylor Wire Company, 116 South Fourth street, have the agency in St. Louis of the Rome Brass and Copper Mills, of Rome, N. Y., for Sheet Copper, Planished Copper and Copper Bottoms.

Philadelphia.

Office of The Iron Age, 220 South Fourth St.,
PHILADELPHIA, Pa., Sept. 2, 1890.

Entering upon what is understood as the fall trade, the outlook is decidedly promising. Taking everything into account, it is a long time since the general outlook in the Iron trade was as uniformly good as it is at present. For some weeks past prices have been firm, with an advancing tendency, and about the only article that is not dearer than it was a couple of months ago is Pig Iron, and even that appears to be steadier and less liable to a decline than at the time mentioned. This being the condition of the Iron trade, it goes without saying that the consuming interests are well employed, not in one department specially, but, so far as this neighborhood is concerned, all are about equally busy, and all with as much work as they can conveniently handle.

Pig Iron.—There is not much change to notice in this department. Prices are steady, and under ordinary circumstances the feeling is a little firmer. That is to say, those who are in the market for Iron, and want particular brands, have no choice but to pay full quoted rates, while those who have a new brand, or something that does not happen to be just what is wanted at the time, may have to accept a comparatively low figure. There is no great amount of this class of Iron offering, however, so that on the whole, the market may be called steady, and unless there is some increase in supply, or decrease in consumption, the chances are favorable for a hardening in prices. The immediate outlook rather indicates a movement of that kind, but with such an enormous capacity for production, there is very little chance of speculative buying, in the absence of which, prices are not likely to vary materially from those recently ruling. For the present, sales in ordinary cases are on the basis of \$18 @ \$18.50, delivered, for No. 1 Foundry, \$16.50 @ \$17 for No. 2 and \$15 @ \$15.50 for Gray Forge. Large lots, forced sales, or new brands may be had at slightly lower figures than these,

but for a standard of comparison these are the only fair quotations that can be given.

Bessemer Pig.—There is a continued interest in this department, with a probability of a more active business in the near future. Holders quote \$19 at furnace, which has been paid during the week for a few small lots, but large buyers are talking 50¢ to \$1 less, but of course it takes two to make a bargain. Holders appear to be in a fairly strong position, as they have still a good deal of Iron to deliver on old contracts, while consumers are evidently beginning to consider the necessity for renewals; hence the chances appear to be somewhat in sellers' favor.

Spiegeleisen.—Prices are nominally \$31 @ \$31.50, duty paid, for 20%, but there is very little disposition to buy unless at 50¢ @ \$1 below these figures. Ferromanganese is held at from \$71 to \$73 for 80%, according to quantity and delivery.

Steel Rails.—There is no movement of any importance. Mills have all the work they can handle, and for some time past have been enabled to keep from 30 to 60 days of full employment ahead, so that without any particularly large orders business has been all that could be desired. These conditions seem likely to continue indefinitely; hence there is little or no change in prices, except for orders specially desirable as to quantity, delivery, terms of payment, &c. For the general run of business \$31.50 at mill is quoted, and from that to \$31, as above noted.

Steel Billets.—There is more inquiry, and the prospect of lower prices seems to have been pretty well dissipated for the present. Sellers quote prices equal to \$33 @ 33.50, delivered in consumers' yards, and are making some sales at these figures, but large consumers are standing out for concessions. Foreign Billets are offered at \$23, in bond, but no recent sales are reported.

Crop Ends.—There is less urgency to place orders, and prices are a shade easier on foreign. Buyers offer \$23, duty paid, with sellers at \$23.50, and from that to \$26 for low phosphorus.

Muck Bars.—Very little business has been done recently, as buyers and sellers fail to agree upon prices. Asking rates are about \$31, delivered, with a few small lots taken at very near to that figure, but consumers consider prices too high, and are, therefore, not inclined to make bids for large lots.

Bar Iron.—The mills are well supplied with orders and prices are firmly maintained at from 1.85¢ @ 1.90¢ for city deliveries, and at 1.75¢ @ 1.80¢ at interior points. New business has not been important during the past few days, but there are plenty of orders in sight, so that manufacturers are disposed to wait developments, as they have plenty of work to go on with. Meanwhile prices are firm as above quoted.

Skelp Iron.—There is a very heavy inquiry, and manufacturers say if they could make deliveries as required, they could secure plenty of orders at 1.9¢ delivered for Grooved, and 2.20¢ @ 2.25¢ for Sheared. Mills are full of work however, and not in a position to take much business until toward November. Earlier deliveries would probably be quoted at a half tenth higher than figures above named. It is also stated that one of the largest mills is about to shut down for an indefinite period, owing to difficulties with their employees.

Plates.—Prices are firm, and in some cases a further advance is asked although orders can be placed in some quarters at the old figures. The demand is very active nevertheless, and prices have an advancing tendency. In the meantime

for lots delivered in consumers yards, prices are about as follows :

	Iron.	Steel.
Ship Plates.....	2.25 @ 2.30¢	2.40 @ 2.50¢
Tank.....	2.30 @ 2.35¢	2.40 @ 2.50¢
Bridge Plate.....	2.30 @ 2.40¢	2.50 @ 2.60¢
Shell.....	2.45 @ 2.55¢	2.60 @ 2.70¢
Flange.....	3.00 @ 3.10¢	2.80 @ 3.00¢
Fire-Box.....	3.75¢	3.75 @ 4.25¢

Structural Material.—Mills are crowded with work and prospects for its continuance very encouraging. Prices are therefore firm at the full rates quoted last week, viz: Angles, 2.20¢ @ 2.30¢, delivered; Sheared Plates at 2.40¢ @ 2.50¢, and from 10¢ to 20¢ more for Steel, according to requirements. Tees, 2.7¢ @ 2.8¢; Beams and Channels, 3.1¢ for either Iron or Steel.

Old Rails.—The position is in all respects unchanged. Spot lots of foreign Rails would command \$25.50 @ \$26 and lots in the interior \$26 @ \$27, but the offerings at these figures are somewhat light, so that sales are unimportant.

Sheet Iron.—Business keeps up on the same liberal scale as noted for some time past. Prompt deliveries are difficult to secure, and the indications are that this will continue pretty well on to the end of the year. Prices are strong and liable to be advanced at any time, but for the present carload lots can be had at about the following prices:

Best Refined, Nos. 14 to 20.....	3.00¢ @ 3.10¢
Best Refined, Nos. 21 to 24.....	3.20¢ @ 3.30¢
Best Refined, Nos. 25 to 26.....	3.40¢ @ 3.50¢
Best Refined, No. 27.....	3.50¢ @ 3.60¢
Best Refined, No. 28.....	3.60¢ @ 3.70¢
Common, $\frac{1}{2}$ ¢ less than the above.	
Best Soft Steel, Nos. 14 to 20.....	3 $\frac{1}{4}$ ¢ @ 3 $\frac{1}{2}$ ¢
Best Soft Steel, Nos. 21 to 24.....	3 $\frac{1}{2}$ ¢ @ 3 $\frac{3}{4}$ ¢
Best Soft Steel, Nos. 25 to 26.....	3 $\frac{3}{4}$ ¢ @ 3 $\frac{1}{2}$ ¢
Best Soft Steel, No. 27.....	4¢ @ 4 $\frac{1}{4}$ ¢
Best Bloom Sheets, 1-10¢ extra over the above prices.	
Best Bloom, Galvanized, discount.....	@ 60 ¢
Common, discount.....	60 @ 65 ¢

Scrap Iron.—There is a good demand at full prices for choice lots, others being somewhat irregular, but as a rule saleable at quotations as follows: No. 1 Wrought, \$21.50 @ \$22, Philadelphia, or for deliveries at mills in the interior, \$22.50 @ \$23.50; \$16 @ \$17 for best Machinery Scrap, \$15 @ \$15.50 for ordinary, \$15.50 @ \$16.50 for Wrought Turnings, \$11 @ \$11.50 for Cast Borings, \$26 @ \$28 for Old Fish Plates, and \$17 @ \$18 for Old Car Wheels.

Wrought Iron Pipe.—There is continued activity in this department, the demand being as large and urgent as reported some weeks ago, with reasonable certainty of a heavy trade for the balance of the year. A meeting of the Pipe Association was held in New York City on August 26, but made no change in discounts, which are as follows: Butt-Welded Black, 47 $\frac{1}{2}$ %; Butt-Welded Galvanized, 40 %; Lap-Welded Galvanized, 47 $\frac{1}{2}$ %; Lap-Welded Black, 60 %; Boiler Tubes, 1 $\frac{1}{2}$ inches and smaller, 45 %; Boiler Tubes, 2 to 4 inches, 50 %; Boiler Tubes, 4 $\frac{1}{2}$ inches and larger, 52 $\frac{1}{2}$ %; Oil Well Casing, 50 %.

Cincinnati.

(By Telegraph.)

Office of *The Iron Age*, Fourth and Main Sts.,
CINCINNATI, September 2, 1890.

Pig Iron.—For several weeks past the local market has been very sensitive and prices have been susceptible of variations within narrow limits, being readily influenced by reports and rumors of transactions, both real and imaginary. The tonnage booked during the summer months has been considerably above the average of the "dull season," and that fact may account for the lull at present,

but while actual sales are small at the moment inquiries are numerous for large amounts. Furnaces are willing to sell for prompt delivery, and in some instances at slight concessions, and for the current year deliveries at present market prices, but for orders running into April and March or February they demand an advance. Buyers, on the other hand, require little iron for early delivery, and where round amounts are involved demand that some deliveries shall run into next year at current rates. Apparently the market is declining, with no pressure to sell and no anxiety to buy. It is evident, however, that confidence is entertained by buyers and sellers alike, and only a few transactions are necessary to cause the market to spring into activity. If the price of Bar Iron, or rather of Finished Iron, is an index, there should be a lively appreciation in pig metal, but it is observed that the reverse is the tendency. A feature of interest recently has been the active and unusual demand for much Bar outside the ordinary channels, and orders for several thousand tons have been placed with the mills in this vicinity, which has given opportunity for placing an equal amount of Pig Iron, mainly of Southern Mill grades. As a rule, the demand is for lower medium grades of both Mill and Foundry Iron, and the furnaces have had little difficulty in disposing of any "off" grades which have been made. Some few Northern stacks have accumulated No. 1 Iron, but this grade is scarce in the South. Generally speaking, nine-tenths of the sales are of Coke brands, but more recently there has been a steady movement in Charcoal Iron, preference being given to the chilling grades. The prices current are without quotable change, being cash, f.o.b. Cincinnati, as follows:

Foundry.	
Southern Coke, No. 1.....	\$15.25 @ \$15.75
Southern Coke, No. 2.....	14.75 @ 15.40
Southern Coke, No. 3.....	13.75 @ 14.00
Ohio Soft Stone Coal, No. 1.....	17.00 @ 17.50
Ohio Soft Stone Coal, No. 2.....	16.00 @ 16.50
Maboning and Shenango Valley.....	17.50 @ 18.00
Hanging Rock Charcoal, No. 1.....	21.00 @ 22.00
Hanging Rock Charcoal, No. 2.....	19.50 @ 20.50
Tennessee and Alabama Charcoal, No. 1.....	18.00 @ 19.00
Tennessee and Alabama Charcoal, No. 2.....	18.50 @ 19.50
Forge.	
Gray Forge.....	13.50 @ 13.75
Mottled Neutral Coke.....	13.00 @ 13.25
Car Wheel and Malleable Irons.	
Southern Car Wheel.....	22.50 @ 23.25
Hanging Rock, Cold Blast.....	22.00 @ 22.50
Lake Superior Car Wheel and Malleable.....	21.00 @ 22.00

Detroit.

WILLIAM F. JARVIS & Co., under date of September 1, 1890, say: No new features whatever have been developed in this market during the week under review, possibly excepting the emphasized scarcity of Jackson County Silveries, which have always been an important feature with nearly every one of our local foundrymen. It is promised, however, by the furnaces in that district that more will be in blast during September. While inquiry has been made for some round lots of Southern Foundry and Forge Irons, indicating some large deals for the immediate future, active transactions have been very light, no large tonnage having been placed. The same may be reported concerning Lake Superior Charcoal Pig, which still remains stationary respecting price, with few deals in the recent past. These furnaces, however, are generally strained to accomplish deliveries on the large contracts made in June. Manufactured Iron is in good demand. Bar Iron at 1.80¢ rates, Detroit, seems scarce, while many mills decline quotations on Sheet and Tank Steel for any near delivery. Beams are not in great demand

here at present. We make quotations for Pig Iron as follows:

Lake Superior Charcoal, all numbers.....	\$20.50 @ \$21.00
Lake Superior Coke, Bessemer.....	20.00 @ 20.50
Katahdin (Maine Charcoal).....	24.00 @ 25.00
Lake Superior Coke Foundry, all ore.....	19.25 @ 20.75
Southern No. 1.....	17.00 @ 17.50
Southern Gray Forge.....	15.25 @ 15.50
Jackson County (Ohio) Silvery.....	19.00 @ 19.50

Louisville.

LOUISVILLE, KY., August 30, 1890.

Pig Iron.—The market has been extremely quiet during the past week, inquiries have been light and sales confined to small lots, and there is no notable change since our last report. There is no pressure from the Southern furnaces to sell their product, and they are holding prices firm, believing that later on the interest will revive and they will be able to obtain better figures, their light stocks and orders booked ahead putting them in position to maintain prices on present basis. We quote same prices as were current last week:

Southern Coke, No. 1 Foundry.....	\$14.75 @ \$15.25
Southern Coke, No. 2 Foundry.....	14.25 @ 14.75
Southern Coke, No. 3 Foundry.....	13.75 @ 14.25
Southern Coke, Gray Forge.....	13.25 @ 13.75
Southern Coke, Silver Gray.....	14.00 @ 15.00
Southern Charcoal, No. 1 Foundry.....	17.50 @ 18.50
Southern Car Wheel, Standard Brands.....	22.50 @ 23.50

Pittsburgh.

Office of *The Iron Age*, Hamilton Building,
PITTSBURGH, September 2, 1890.

Pig Iron.—There has been no marked change in the situation during the past week; both production and consumption continue large and the one keeps pace with the other. Prices have changed but little one way or the other. All the furnaces in condition are in blast and the output is immense, but consumption appears to be fully equal to the occasion. There is little or no accumulation. Standard brands of Forge Iron are still quotable at \$15.25 @ \$15.50, cash, with the great proportion of the business at the inside quotation. Bessemer continues weak, and while there have been no sales reported below \$18.25 @ \$18.30 cash, it is intimated that a desirable order would no doubt be placed at \$18, cash. Foundry Irons in fair request, although the demand is chiefly for small lots. We quote prices as follows:

Neutral Gray Forge.....	\$15.25 @ \$15.50, cash.
All Ore Mill.....	16.00 @ 16.50, "
White and Mottled.....	14.50 @ 14.65, "
No. 1 Foundry.....	17.25 @ 17.50, "
No. 2 Foundry.....	16.25 @ 16.50, "
No. 3 Foundry.....	15.75 @ 16.00, "
No. 2 Charcoal Foundry.....	21.50 @ 22.00, "
Coal Blast Charcoal.....	27.00 @ 30.00, "
Bessemer Iron.....	18.00 @ 18.50, "

Muck Bar.—There is continued inquiry, especially for immediate or nearby delivery, and the market is firmer, but prices remain unchanged at \$29.50 @ \$30, cash. Rumors obtain of sales having been made above our outside quotation, but they were not well authenticated. Some of the largest consumers say that they have not yet paid as high as \$30, and brokers aver that it is exceedingly difficult to obtain the price quoted. At present prices the margin for converting is better than usual, and it is feared will not be much longer maintained.

Manganese.—Continues dull; 69¢ @ 70¢ is quoted for 80 % at seaboard, with a sale of 200 tons reported at \$69.85 at Baltimore. It is reported that the mill of Carnegie, Phipps & Co., stopped for some time past, will be started up again shortly.

Manufactured Iron.—There is a continued good demand for all kinds of Manufactured Iron; mills are busy and some of them are working up to their full capacity. Prices remain unchanged, but firm, as quoted: Bars, 1.85¢ @ 1.90¢; Plate and

Tank, 2.20¢ @ 2.25¢; No. 24 Sheet, 2.85¢ @ 2.90¢; Grooved Skelp, 1.80¢ @ 1.85¢; Sheared, 2.10¢ @ 2.15¢, all for 60 days, with 2% off for cash.

Structural Iron.—Mills report that they are very busy; however, this is usually the case at this season of the year, when contractors are anxious to get all the outside work done that is possible before the winter season sets in, when the days are short and the weather is disagreeable. As stated in our last report, there are a great many large buildings in process of construction as well as bridges, and large quantities of Structural Iron required just now, and mills making a specialty of the same are pressed on all sides. Prices unchanged: Angles, 2.20¢ @ 2.25¢; Beams and Channels, 3.10¢; Tees, 2.80¢ @ 2.85¢; Steel Sheared Bridge Plates, 2.65¢ @ 2.70¢; Universal Mill Plates, Iron, 2.35¢; Refined Bars, 1.90¢ @ 2¢.

Steel Plates.—No change in prices. A continued good demand is reported. Fire Box, 4.25¢ @ 4.75¢; Flange, 2.20¢ @ 2.30¢; Shell, 3.10¢; Tank, 2.70¢ @ 2.75¢.

Merchant Steel.—A continued good degree of activity is reported. Prices unchanged. Tool Steel, 8¢ and upward, as to quality and brand; Crucible Spring Steel, 4¢, do.; Machinery, 4½¢; Open Hearth Steel, base sizes, 2½¢ @ 3¢; Bessemer Machinery, 2.35¢ @ 2.40¢; Tire Steel, 2.50¢ @ 2.55¢ rates.

Wire Rods.—There is not apparently as much inquiry as there was a month ago, and this, in connection with an increasing production, has produced an easier feeling, although prices remain about as last quoted, \$44.50 @ \$45, cash, at makers' mill. The mill of Carnegie, Phipps & Co. was started up to-day after having been shut down about two months for repairs, and the one at New Castle is also in operation, but it is said that it is not working very satisfactorily. The Braddock Company, now that their Nail factory is in full operation, will have but few, if any, Rods to sell.

Billets and Slabs.—There has been some inquiry the past week, mainly for immediate or near-by delivery. We are cognizant of some manufacturers having been obliged to go on the market and buy in order to cover contracts, the mills are well sold for this month, some of them for October and for delivery during the time in question. Prices may be quoted at \$30.50 @ \$31. For later months, however, it is believed that contracts could be made at \$30, and possibly less. Bessemer Pig continues weak and the products are sympathizing.

Nails.—The Cut Nail trade continues light, but will no doubt improve as the season becomes more advanced. No change in prices. Steel Cut Nails, \$1.85 60 days, 2% off for cash, in carlots and upward; Iron Nails, about 10¢ per keg less than Steel. Wire Nails, barely active, but under the influence of an increased production, easier; we now quote at \$2.40 @ \$2.45, 60 days, 2% off for cash, in carlots. The factory of Carnegie, Phipps & Co. after having been stopped for a couple of months, were started up to-day, and the firm named are said to have orders booked sufficient to absorb their production for a couple of months.

Wrought Iron Pipe.—There is nothing especially new to note; mills are all very busy working up to their full capacity and likely to be for some time to come. The regular monthly meeting of the Association took place last week, but there was little done, excepting to reaffirm former prices. It is expected that new business will fall off before long, but the mills are well sold ahead and will have all they can do until well on the close of the year.

Old Rails.—There does not appear to be much inquiry here, but there are buyers in the Valleys, where sales have been made at \$27.75. There was a small lot sold this week to go to Youngstown which would cost the buyer close to \$28, delivered at his mill. Old Steel Rails continue in scant supply and may be quoted at \$21.50 @ \$22.50 for short and long pieces.

Railway Track Supplies.—There has been an increased demand for Spikes of late. Dilworth, Porter & Co. report having about all they can do. No change in price—\$2.15, 30 days, delivered free on cars at works; Iron Splice bars, \$1.95 @ \$2.05; Steel ditto, \$2 @ \$2.10; Iron Track Bolts, \$2.85 with Square and \$3 with Hexagon Nuts.

Steel Rails.—While the mills are well supplied with orders, there has been but comparatively little new business of late. Prices remain about as last quoted, \$31.50 @ \$32.50, cash, at mill, according to character of order and delivery. Carnegie, Phipps & Co. had some 6000 tons taken South and West by river during the past week. The Allegheny Bessemer Company had five barges loaded with Rails, but just before the rise had them unloaded and shipped by rail, being apprehensive that there would not be a rise in time to get them out.

Old Material.—There is a fair demand at unchanged prices. No. 1 Railroad Wrought Scrap, \$22.50, net ton; Wrought Turnings, \$14.50 @ \$15; Car Axles, \$28 @ \$29; Cast Scrap, \$16, gross; Old Car Wheels, \$18 @ \$18.50. Sales of Steel Bloom and Rail Ends at \$22.50 @ \$23.

Connellsville Coke.—There is a continued steady demand, and the only complaint made by operators is in regard to the scarcity of cars. Prices unchanged, as follows: Blast Furnace Coke, f.o.b. at ovens, \$2.15; Foundry Coke, \$2.45; Crushed Coke, \$2.65 per ton of 2000 lb. Prices at other points are as follows:

	Foundry Coke.	Crushed Coke.
On Cars at Boston and points taking Boston freight rates.	\$6.45	\$6.65
On cars at Baltimore.....	4.62	4.82
On cars at Buffalo.....	4.70	4.90
On cars at Cleveland.....	4.15	4.35
On cars at Cincinnati.....	5.10	5.30
On cars at Toledo.....	4.80	5.00
On cars at Detroit.....	4.80	5.00
On cars at East St. Louis.....	5.65	5.85
On cars at St. Louis.....	5.80	6.00
On cars at Chicago.....	5.20	5.40
On cars at Milwaukee.....	5.30	5.50

Freight rates from the regions are unchanged.

(By Telegraph.)

There is a continued good degree of activity in Iron and Steel, but no change in prices. The rate war carried on by railroads tapping the Southwest is ended after an extended conference. A new schedule of rates has been agreed upon advancing all classes of freight to Texas and Southwest points. Finished Iron and Nails in car lots have been advanced to 82¢ @ 100. Shipments to Texas points and beyond have been very heavy of late, shippers having expected an early settlement of the war.

Samuel W. Hay, 512 Hamilton Building, has issued a circular relating to the Hercules brands of Crucible Cast Steel, manufactured by Geo. F. Egan & Co., Pittsburgh.

New York.

Office of The Iron Age, 66 and 68 Duane street, New York, September 3, 1890.

American Pig.—There has been only a run of moderate sized orders, although some sellers report that an increase in them is observable. Still the market continues

very quiet with values remaining as quoted at \$17 @ \$18 for No. 1 and \$16 @ \$16.50 for No. 2 Foundry, good Northern brands, while Southern Irons are selling at \$17 @ \$17.25 for No. 1, \$16 @ \$16.25 for No. 2 and \$15 @ \$15.25 for No. 3. Southern Car Wheel Iron is quoted \$20.50 @ \$21 for Nos. 3, 4 and 5, and \$19.50 @ \$20 for Nos. 1 and 2, delivered.

Spiegeleisen and Ferromanganese.—The market is exceedingly dull. There is inquiry for Spiegeleisen from the large mills, and no special pressure to sell, so that we quote \$30 @ \$30.50 for German, while English, which is preferred by some Steel makers, is quoted \$31 @ \$31.50. Ferromanganese is quiet at \$70.50 @ \$71 for forward delivery.

Wire Rods.—At least two of the domestic mills, which have been idle for some time past, are now running again, so that the prospect of a fuller supply is better. Importers still quote \$43.50 @ \$44 for German Rods, buyer taking risk of duty. There has been some business in Swedish Rods at \$66 for ordinary and \$72 @ \$73 for special.

Steel Rails.—Only a number of sales of small lots are reported, aggregating about 10,000 tons. They include a 3000 ton lot each for the Pacific Coast and the South, and one small lot for New England. For prompt delivery, moderate sized lots, the market may be quoted \$31, but for larger parcels, winter delivery, that price would probably be lowered notably. Aside from an order for 25,000 for the Union Pacific Railroad, no large blocks are now in the market. Just how the demand is going to develop it is impossible to predict. Until now it has not been heavy. If it should fall below the reasonable expectations now entertained by the Rail mills, there is likely to be sharp competition with lower figures. The demand, whatever it may turn out to be, will be shown during the current month.

Manufactured Iron and Steel.—Merchants generally report quite a lively trade. Recently considerable sales of Bar Iron—aggregating 500 tons—were made in this market by a mill in Central Pennsylvania. Car specifications, for which until lately 1.70¢ flat, delivered, has been quoted, have sold at 1.70¢, half extras. A large block of Hoops, upward of 2000 tons, for the Standard Oil Company, has been taken at an advance of \$1 per ton over the last sale, and in the West a Mahoning Valley mill has accepted a 3000-ton order for the Cotton Oil Seed Company.

Old Rails.—Although there is considerable inquiry from consumers, practically no business has been done. Importers claim that foreign Rails cannot be laid down here below \$25.50 @ \$26, a price which the mills will not pay. For American Rails we quote nominally \$24.50 @ \$25. There are negotiations pending for a round lot of Old Steel Rails.

Fastenings.—The market is stronger. We quote: Spikes, \$2.05 @ \$2.15; Fish Plates, \$1.90 @ \$1.95, and Bolts and Nuts \$2.95 @ \$3.15, delivered.

Financial.

The business outlook has improved. Money is easy, crop prospects are better, and exports more satisfactory. Labor troubles have subsided, and in consequence all lines of railway transportation are unobstructed. The silver question is less a source of anxiety, at least with reference to the immediate future, and bond purchases are on a liberal scale, releasing large amounts for use in current business transactions. On Saturday Secretary Windom issued a second circular offering to redeem \$20,000,000 more of the 4½% bonds and pay the full year's interest in

advance. The offer remains open until September 16. This, together with the \$20,000,000 worth called for on the 21st inst., makes a total of \$40,000,000. The course of Secretary Windom is construed as evincing a determination to prevent a recurrence of stringency in the New York market. The necessity for Secretary Windom's call for \$20,000,000 more is indicated by Saturday's bank statement, which shows the reserves still \$500,000 below the legal limit, notwithstanding his previous heavy disbursements. The banks of this city lost about \$2,250,000 through the movement to the interior, and their net gain from the Sub Treasury was only \$3,400,000. However, the imports have fallen off so that the absorption of money for customs will be a less serious drain upon the money supply. The associated banks had to contract their accommodations during the week to the extent of over \$5,000,000, and are in the aggregate lending about \$14,000,000 less than they were a year ago. While their available resources are curtailed, the volume of business is 10 to 15 % larger than at the corresponding date last year. Time money was nominally 6 % for all dates from 60 days to six months, but no new engagements were made, and the business was confined to renewals of loans. In commercial paper little of consequence was done, and nothing by the majority of the city banks. On Saturday it was noticed that there was some inquiry for high grade paper from country banks. A feature of the week has been the heavy demand for money in the West, where the situation is thus described by the *Chicago Tribune*: "Money is tight only as the banks choose to make it so. The condition of the Chicago banks has seldom been stronger. There is plenty of money for the merchants and manufacturers. Any fear that legitimate business enterprises are to suffer from lack of funds that they would under ordinary circumstances be entitled to is quite unnecessary. The banks have drawn the reins tightly on speculative ventures, and the effect has probably been beneficial, but there is plenty of money in their vaults for all commercial needs." The failure of the Boston banking firm of Potter, Lovell & Co. for \$2,000,000 had no effect in this market.

The Stock Exchange market was dull and featureless, partly owing to holiday interruptions. Saturday's bank statement had no appreciable influence. A flurry in Chicago gas was caused by a report that the Grand Jury, of Cook County, Ill., would be called upon to investigate the operations of the trust. On Tuesday, influenced by higher prices in London and Secretary Windom's second circular, the market was firmer, but dull. Lead Trust and Cotton Oil Trust advanced.

Imports of merchandise at New York for the week, \$7,550,000; imports of specie, \$901,000; exports, do., \$180,000.

The merchandise freight rate from New York to Kansas City has been reduced from \$1.12 to 75¢ @ 100 lb. The Interstate Commerce Commission has finally agreed indefinitely to extend the order reducing rates on grain.

United States bonds are quoted as follows:

U. S. 4 ¹ / ₂ %, 1891, registered.....	104
U. S. 4 ¹ / ₂ %, 1891, coupon.....	104
U. S. 4 ¹ / ₂ %, 1907, registered.....	124 ¹ / ₂
U. S. 4 ¹ / ₂ %, 1907, coupon.....	125 ¹ / ₂
U. S. currency 6s. 1895.....	113 ³ / ₄

Bankers' sterling is steady. Posted rates are \$4.82¹/₂ @ \$4.86¹/₂. The Bank of England rate of discount remains at 4 %. A London despatch says no permanent reaction is probable until silver reaches the American metallic par.

The public debt statement for the month of August shows a net reduction of less than a million, \$833,072.75. It is an interesting fact that out of the \$143,000,000

of bonds held by the banks to secure circulation, about \$36,000,000 are of the 4¹/₂ per cents due a year from September 1. The total amount of silver purchased since August 13, when the present law went into effect, is 3,504,000 ounces, leaving only 996,000 ounces to be purchased between now and September 13 to meet the requirements of the law.

The Farmers' National Congress, which was in session last week at Council Bluffs, adopted resolutions condemning the National Banking system, and asking that all money be issued by the Government.

The merchandise markets show a fair degree of animation. Among dry goods jobbers there is a large trade, with a strong market and foreign goods in improved request, the latter subject to a revision of prices in case the conditions of purchase are changed by the passage of a tariff bill. Southern buyers show the effects of expected millions to come from the large and high priced crop of cotton. Prices of Western products are inclined to droop. Wheat is down 6¢ @ bushel, corn ditto, 3¢ @ bushel, exports slow. Coffee is firm. Provisions are lower through weak speculation. Sugar is ¹/₈¢ higher for raw and refined. The ocean steamship men have booked cotton up to the middle of September at rates as high as ¹/₄d. @ ¹/₄d.

Metal Market.

Copper.—There is practically no change in the position of the market. Consumers' purchases are still of unimportant character, being chiefly of small quantities for early delivery. From other quarters there is no demand at the moment. The mining companies, however, are moving off considerable Copper on old contracts, and, while an occasional small lot comes out from second hands at a slight concession, former prices are firmly adhered to as a rule. Lake Superior Ingot and Bars are quoted at 17¢, Arizona Ingot at 15¹/₄¢ @ 15¹/₂¢, and Common Casting Copper at 14¹/₄¢ @ 14¹/₂¢, according to brand. European statistics show that the visible supply in England and France decreased nearly 2600 tons last month, with a decline of 2350 in the quantity of fine Copper held in England the most noteworthy change. The deliveries were 1900 tons less and the supplies received 2400 tons less than in September last year.

Pig Tin.—The local market has shown little animation the past week, but prices have further hardened, moving upward in sympathy with higher quotations from Europe, but responding in a very slight degree only to a subsequent reaction. Spot supplies remain under very close control, and it is asserted that arrivals due this month are well taken care of also. Straits has been sold at 22¢, net cash, in 5-ton and 10-ton lots, and does not appear to be obtainable now at a lower price than 21.95¢ net; but small quantities are sold to the out of town trade at about the first-named figures. The Exchange quotations on 10-ton lots were 21.85¢ bid, 21.95¢ asked, spot; 21.85¢ @ 21.95¢ September delivery, 21.90¢ @ 21.95¢ October delivery; 21.70¢ @ 21.90¢ November delivery, and 21.65¢ @ 21.95¢ December delivery. The visible supply in Europe and America on September 1 is estimated at 12,197 tons, against 12,858 tons last month and 13,302 tons a year ago. The American supply is placed at 1500 tons on spot and 1850 tons afloat. Shipments from the Straits last month are figured up rather variably, some authorities making the totals 1000 tons to America and 800 tons to Great Britain, while others give 975 tons and 675 tons respectively.

Pig Lead.—Local transactions during the week are estimated at 800 to 1000

tons at prices from 4.70¢ up to 4.80¢ for good sized lots, up to 4.82¹/₄¢ for single carloads. The position remains strong. Consumption is good and supplies are sparingly offered here, being moderate, while Western holders rarely quote for deliveries prior to October. At the present time 4.90¢ is asked. The tendency of prices toward the 5 cent point brings up the question of importations. As yet there is no opportunity, except for Lead that may be re-exported in the form of solder on cans, &c., on which a drawback is allowed. For this purpose about 150 tons have been purchased during the past week, the bulk of it by the Standard Oil Company.

Spelter.—The demand has been moderate during the past week, and is so at the present time, with the call rarely for more than single carloads. There is no pressure to make sales, however, and prices remain steady at 5.50¢ @ 5.55¢ for Western Prime.

Antimony.—About the usual trade is passing. Prices are steady at 23¢ for Cooksons, 20¢ @ 20¹/₄¢ for Halletts and 21¢ for L X brand.

Tin Plate.—During the early portion of the week under review a large business was effected, involving a considerable amount of supply for future shipment and the transfer of a very fair quantity of spot stock. Prices advanced sharply all along the line under the stimulus of this business and further advance in values in the foreign market. Extreme high values have served to check operations somewhat the past few days, however, and the market at the close was quiet though very firm. Quotations for large lines, on the spot, are as follows: Coke Tins—Penlan grade, 1C, 14 x 20, \$5.20; J. B. grade, do., \$5.25; Siemens Steel, —; Bessemer do., \$5.20. Stamping Plates—Bessemer Steel, Coke finish, 1C basis, \$5; Siemens Steel, 1C basis, \$5.10; IX basis, \$6. 1C Charcoals—Calland grade, IX, \$5.50; Melyn grade, \$6; for each additional X add \$1.50; Allaway grade, \$5.25; Grange grade, \$5.37¹/₂; for each additional X add \$1. Charcoal Tins—Worcester, 14 x 20, \$5.25; 20 x 28, \$10.50; M. F., 14 x 20, \$7.25; do., 20 x 28, \$15.50; Dean, 14 x 20, \$4.75; do., 20 x 28, \$9.75; D. R. D. grade, 14 x 20, \$4.65; do., 20 x 28, \$9.50; Mansel, 14 x 20, \$4.65; do., 20 x 28, \$9.50; Alyn, 14 x 20, \$4.75; do., 20 x 28, \$9.75; Dyffryn, 14 x 20, —; do., 20 x 28, —; Wasters—S. T. P. grade, 14 x 20, \$4.45; do., 20 x 28, \$9; Abercarne grade, 14 x 20, \$4.40; do., 20 x 28, \$8.75.

New York Metal Exchange.

The following sales are reported:

THURSDAY, August 28.	
25 tons Tin, October.....	21.90¢
FRIDAY, August 29.	
10 tons Tin, October.....	21.85¢
10 tons Tin, November.....	21.80¢
35 tons Tin, October.....	21.80¢

Imports.

Hardware, Machinery, &c.

Brown Bros. & Co., Mach'y, cs., 5
Baker, Hermann & Co., Arms, cs., 31
Botany Worsted Mills, Mach'y, case, 1
Capen, A. M., Mach'y, cs., 2
Curley, J. & Bro., Cutlery, cs., 2
Degrauw, Aymar & Co., Chain, pgs., 10
Folsom Arms Co., Arms, cs., 10
Godfrey, C. J., Mdse., cs., 4; Arms, cs., 3
Hammacher, Schlemmer & Co., Nails, cs., 47
Hartley & Graham, Mdse., cs., 38
Lau, J. H. & Co., Arms, cs., 10
Meacham Arms Co., Mdse., cs., 11
Newton & Shipman, Files, cks., 2
Parsons, W. H. & Co., Mach'y, pgs., 6
Schoverling, Daly & Gales, Mdse., cs., 28
Werlemann, H., Mdse., cs., 20
Wiebusch & Hilger, Mdse., cs., 11
Wyman & Co., C. H., Mdse., cs., 36
Order—Mach'y, cs., 56.

British Iron and Metal Markets.

[Special Cable Dispatch to The Iron Age.]

LONDON, WEDNESDAY, September 3, 1890.

Transactions in Pig Iron warrants have again been on a larger scale, with a further advance early in the week (Scotch selling at 50/6), but subsequently a reaction in prices all along the line consequent upon realizations. There were dealings to-day at 40/ @ 49/3 for Scotch; 45/9 for Cleveland and 58/ for Hematites. Home consumption of Pig Iron is quite heavy at present, and shipments continue on a liberal scale. Steel Ship Plates have advanced to £6. 17/6 at Barrow, but on other Steel there has been little change. German Plate makers have reduced their prices for Welded Iron Plates 20 marks this week.

Prices for Pig Tin on the spot reached as high as £98. 5/ early in the week under the influence of large demand and reported probable curtailment of Straits production, owing to heavy fall in dollar prices. Latterly realizations and manipulation brought about a reaction to £96. 10/, and to-day £97. 10/ @ £97. 15/ is quoted, with the market looking stronger.

In Copper there has been a brisk business and the market remains very firm. The largest holders of supplies here have made quite heavy purchases and the market has received additional support from the covering of short sales. Consumers have bought largely.

Tin Plates have been in good demand, and on actual sale 1/ advance has been made, bringing the actual trading basis up to the highest prices asked by makers last week. The market is in strong position, and sellers express confidence in a still further rise, which is now asked.

Scotch Pig Iron.—In makers' brands business has been less active and prices have undergone only slight changes.

No. 1 Coltness, f.o.b. Glasgow	64/
No. 1 Summerlee, " "	62/
No. 1 Gartsherrie, " "	61/
No. 1 Langloan, " "	63/6
No. 1 Carnbroe, " "	51/
No. 1 Shotts, " at Leith	63/
No. 1 Glenarnock, " Ardrossan	60/6
No. 1 Dalmellington, " "	54/
No. 1 Eglinton, " "	62/

Steamer freights, Glasgow to New York, 2/ nominal; Liverpool to New York, 7/6

Cleveland Pig.—Demand has fallen off somewhat and prices are lower, in sympathy with the decline in warrants. Makers quote 46/ Middlesborough, f.o.b.

Bessemer Pig.—There has been a fairly active movement and prices are firmly held. West Coast brands, Nos. 1, 2 and 3, 58/6, f.o.b. shipping port.

Spiegeleisen.—The demand continues good and prices remain firm. English 20 % quoted at 100/, f.o.b. shipping port.

Steel Rails.—Only a moderate business passing and little change in prices. Heavy sections quoted at £5 and light sections £5. 15/ @ £6, f.o.b. at N. W. England shipping point.

Steel Blooms.—The market rather more active and prices firmer. Makers quote at £4. 17/6 for 7 x 7, f.o.b. at N. W. England shipping point.

Steel Billets.—Makers firm at last week's prices and report demand fairly active. Bessemer, 2½ x 2½ inches, £5, f.o.b. at N. W. England shipping point.

Steel Slabs.—There is little doing, but makers are stiffer on prices. Bessemer quoted at £5, f.o.b. at N. W. England shipping point.

Old Iron Rails.—The market rather dull and prices without change. Tees quoted at £3. 2/6, @ £3. 5/ and Double Heads £3. 5/ @ £3. 7/6, f.o.b.

Scrap Iron.—Demand is slow and values are unchanged. Heavy Wrought quoted at £2. 7/6, f.o.b.

Crop Ends.—A moderate business doing at unchanged prices. Bessemer quoted at £2. 17/6 @ £3, f.o.b.

Tin Plate.—Business fairly active at the advanced prices quoted herewith. Makers hold for still higher figures. We quote f.o.b. Liverpool:

1C Charcoal, Alloway grade	16/9 @ 17/0
1C Bessemer Steel, Coke finish	15/6 @ 15/9
1C Siemens " "	15/9 @ 16/
1C Coke, B. V. grade	15/3 @ 15/6
Charcoal Terne, Dean grade	14/6 @ 14/9

Manufactured Iron.—In this line there is a very fair business, with prices firm, but no change except in Black Sheets. We quote, f.o.b. Liverpool:

Staff, Marked Bars	£ s. d. @ 9 0 0
" Common	7 2 6 @ 7 5 0
Staff, Bk Sheet, singles	7 17 6 @ 28 0 0
Welsh Bars (f.o.b. Wales)	6 7 6 @ 6 10 0

Tin.—The market firm to-day and moderately active. Straits quoted at £97. 10/ @ £97. 15/, spot, and £98 @ £98. 10/ for three months futures.

Copper.—A good business doing, but at slightly easier prices. Merchant Bars quoted at £59. 15/ @ £59. 17/6, spot, and £60 @ £60. 2/6, three months futures. Best Selected, £66.

Lead.—There is a slight advance in prices and the demand is better. Quoted at £13. 5/ for Soft Spanish.

Spelter.—The demand very fair and prices again rather higher. Quoted at £24. 5/ for Ordinary Silesian.

Coal Market.

As a matter of fact the prices of Anthracite Coal are weaker than in the middle of August, and there is nothing to warrant the advance of about 15¢ per ton agreed upon by the meeting of sales agents last week, it being notorious that neither the advance in June or July was made effective. All through the summer months the large engagements last spring for delivery at low prices ruled the market, it being difficult to discriminate between early and late buyers, in an attempt to enforce an advanced schedule. For obvious reasons the latest prices fixed by the companies must, for the time being, be only nominal, as follows: Stove \$4.15, Egg \$3.90, Chestnut \$3.75, Broken \$3.55. The smaller steam sizes are weak and irregular. Reading's circular is as follows: Hard white ash at Port Richmond—Lump and Steamboat \$3.85, Broken \$3.65, Egg \$3.80, Stove \$3.90, Chestnut \$3.50. New York, via Port Liberty, Hard white ash—Lump, Steamboat and Stove \$4.15, Broken \$3.90, Egg \$4.05, Chestnut \$3.75. Free white Ash—Broken and Chestnut \$3.75, Egg \$3.90, Stove \$4.15. Schuylkill red ash and Lorberrry—Egg \$4.10, Stove \$4.40, Chestnut

\$3.95. Lykens Valley—Broken \$4.75; Egg and Stove \$5, Chestnut \$4.50. Actual prices for Lehigh are: Stove, \$3.85; Chestnut, \$3.75; Broken and Egg, \$4.

Anthracite Coal production for the month ended August 23, compared with the same period last year, as follows:

	1890.	1889.
	Tons.	Tons.
Wyoming	384,343	428,160
Lehigh	131,541	139,072
Schuylkill	187,283	232,468

Total..... 703,167 799,706
From Jan 1..... 21,114,538 21,535,263

Bituminous Coal is quiet, with large deliveries on contract and rumors of cut prices. Interruption of Coal traffic on the Pennsylvania, resulting from a temporary glut of freight pending the Central strike, has caused inconvenience to operators in some instances, such as were caught short.

The Pottsville *Miners' Journal* says: "The week at home began with a resumption of work at the 40 odd Reading collieries which had been 'ordered off' for two days to reduce the stock at tidewater. The present hope of the company is to continue steady work. Its main object will be to enforce the policy of restriction, if possible, and to further advance the selling price of Coal. The best judges incline to the opinion that the restrictive agreement will be fairly well upheld, but there is not much prospect of any advance being made in the actual selling prices. The difficulty will be to get the advance with the markets already glutted." About 3,000,000 bushels of Coal were shipped from Pittsburgh down the river to Cincinnati and Louisville. The total output will reach about 112,000,000 bushels, or, counting 26 bushels to the ton, over 4,000,000 tons.

Cumberland reports for the week, 82,700 tons; Clearfield, 57,000; Pocahontas, 39,800.

The Boiler Makers.

(By Telegraph.)

A. T. Douthett, secretary of the American Boiler Manufacturers' Association, has tendered his resignation. Col. E. D. Meier, of St. Louis, will probably succeed him.

The plant of the Spaulding Iron Company, at Brilliant, Ohio, was sold yesterday to George K. Wheat, of Wheeling, for \$60,000.

Fireproof Houses.

The combustible nature of Japanese houses renders large fires a frequent and disastrous calamity, says the *Detroit Free Press*. Hence since a long time ago the more wealthy Japanese merchants, as well as farmers, have been in the habit of building a kura or fireproof mud house contiguous to their shops and dwellings, yet generally entirely isolated. Into these are hurried at the first alarm which indicates a fire approaching the premises, the portable property, household stuffs, merchandise, &c., and the kura is then closed, and if time permits the joints of windows and doors are sealed with fresh mud. A fire passing around and over such a structure will leave its contents unharmed. It is a very common thing to see in Yokohama, in the streets of the native town, many of these kura built with much attention to architectural effect. They resemble very closely gigantic fireproof safes which may be one, two and even three stories high. The kura is built of a light framework of wood, between the openings of which is securely fastened open wicker work of bamboo. Then the whole wall surface, inside and out, is solidly filled with stiff plastic mud taken from the bottom of the rivers, and when thoroughly dried is smoothly covered with stucco, often treated ornamentally.

Aboriginal Carpentry.

In speaking of ancient American tools, H. F. McLeod, of the Smithsonian Institute at Washington, recently said: "Aboriginal carpentry was the chief trade of our predecessors on this continent. The Indians and the mound builders had a very good idea of woodworking. You will see even now some very pretty joining done by Sioux Indians. Their tent poles make a fit which many a white carpenter would not like to try to better."

"The best carpenters, of course, were the Aztecs, who had arrived at quite a high stage of art, and whose tools, although they knew nothing of steel, are really excellent. We have a few of their tools at the Smithsonian, but the best collection is, of course, in the City of Mexico. The material used was almost wholly glass, especially for the finer parts of their wood cutting. To chop trees they used flint axes, and for rough hewing out of logs the same, but when it came to the accurate fitting in of the hewn timber, they handled glass knives, chisels and saws very deftly and with beautiful results. There is a ceaba wood post in Washington with hieroglyphics and faces cut upon it all with glass. You can see bits of the original chisel still sticking in a corner of the wood, where it broke off three centuries ago under the hand of the workman. The Aztecs knew how to make a very good and manageable glass, and their best cutting blades, swords, daggers and spears, saws, chisels and axes were made of it. When the edge dulled they broke it from the end, instead of sharpening it, and got a new cutting line."

"You can see a great deal of aboriginal carpentry still in use among the Moqui Indians of the United States. Of course they use our tools now, but they follow out their old patterns. They know how to make ladders and they swing their doors on hinges from the top, and they know how to mortise timbers—knew how long before Columbus landed in America. Of course they use our tools differently from our way. The chisel they push rather than hammer, work the board up and down on a fixed saw rather than the saw on the board, and withal they get creditable results. The framework in the Pueblos is quite as honest as anything we have in America."

New School of Architecture.

The preliminary details of organization of the New School of Architecture, to be opened at the University of Pennsylvania in the fall, have now been largely completed, and the authorities of the university are enabled to announce a programme that will challenge comparison with any school of its class in the country. Representatives of the faculty have inspected some of the more important architectural schools in this country with a view of obtaining the latest and best views on methods in vogue elsewhere, and an examination will also be made of the larger schools of Europe, it being the intention of those having the affairs of the school in hand to leave no step untaken that will add to the strength of and value of the work they have undertaken. The course of study provides full theoretical, practical and artistic instruction as a foundation for professional work. While it is essentially a technical school, it has not been forgotten that a successful architect must be a man of broad culture, and therefore a limited number of general studies have been retained which will serve as a basis for such training. Special attention will be given to practical work, it being the intention to give the student a knowledge of practical matters, important and necessary to architects, but which is frequently difficult to acquire in an office. In fact, the plans already outlined

include a greater proportion of practical work than is to be found in other architectural schools, and it is this which will give the new school an individuality of its own.

With the exception of those who are members of the faculty by virtue of their office in the university, the school is entirely under the charge of men who have had long and thorough training in practical questions of architecture. The faculty is composed of Dr. William Pepper, provost of the university, and ex-officio president; Dr. Horace Jayne, Dean of the college; Mr. Theophilus P. Chandler, Jr., director of the school; Mr. Thomas W. Richards, professor of architecture, and Mr. Charles E. Dana, professor of art. Mr. Chandler is one of the foremost architects of Philadelphia, and has erected many of the more important buildings built here in recent years. His reputation is more than local, and the excellence of his work is sufficient guarantee of the thoroughness with which the school will be conducted. Prof. Richards, who is also a trained architect, has occupied the chair of architecture in the university for some years, and brings to the school the knowledge of a practical architect and the ripe experience of a successful teacher. Mr. Dana is an accomplished water colorist, and will have charge of that branch of instruction. In addition to these gentlemen, who make the regular faculty, the school will have the advice and assistance of a number of well-known architects in Philadelphia who will lecture on special architectural subjects, and also in a measure supervise a portion of the practical work of the students. The university will thus be able to offer not only a technical course provided by its own instructors, but give almost as much office training or its equivalent, as would be obtained by one working in an office exclusively.

The lecturers already secured include Mr. Frank Furness, Mr. Wilson Eyre, Jr., Mr. Frank Miles Day, Mr. Joseph M. Wilson, Mr. Addison Hutton, Mr. John Stewardson and Mr. Barr Ferree. In addition to the lectures to be given by these gentlemen, arrangements have been made to supplement them by lectures by contractors, builders, plumbers, &c. The school will therefore be in every sense, a practical school of practical men for practical work.

The technical and practical studies are distributed throughout the whole four years of the course. In the first year greater time is allotted to general studies than in the last three years, but the architectural work is continued from the beginning. Candidates for admission are required to pass an examination in English, including grammar, composition and the reading of certain standard books, in the history of the United States and a portion of ancient history and mathematics, arithmetic, algebra and plane geometry. In addition they must show ability to sketch some ordinary object in a satisfactory manner, and produce drawings indicating familiarity with the use of mathematical drawing instruments. In the first year instruction is provided in English, mathematics, chemistry and French. The work on drawing is begun with a thorough course in geometrical, isometrical and free hand drawing and exercises in simple architectural design. In the second year the studies in English, French and mathematics are concluded, additional time given to drawing and the technical studies increased by lectures and recitations in physics and applied chemistry, the latter being a course especially adapted to architectural work and dealing with the chemical and physical properties of materials, stones, bricks, mortars, cements, &c., while in physics special attention is given to electricity, light and acoustics. In the third year the volume of technical studies is much increased. The work in physics

is concluded with practical work in the physical laboratory and an extended course in engineering begun, including exercises in surveying. Like the chemistry of the second year this course has been especially devised to meet the requirements of the architectural students. Further progress is made in drawing and water color and lectures on the history of architecture begun. The students have previously familiarized themselves with this portion of the subject by reading Fergusson's History of Architecture during the first two years. In the fourth year's courses in social science and geology are offered engineering, including sanitary engineering, completed; specifications, contracts, estimates, &c., considered and the history of architecture and ornament concluded.

Throughout each year ample facilities are afforded for practical work in the workshop, including demonstrations and exercises in carpentering, construction, bricklaying, plastering, tin work, &c., the object being to make students familiar with the physical properties of materials and tools. Weekly exercises in modeling are also provided and visits made to technical establishments and buildings in progress of construction, at stated intervals. Work is not interrupted during vacation, but students are required to pass a certain amount of time in an architect's office or to produce a certain quantity of work. Arrangements have also been made for lectures on allied subjects, as landscape gardening and archaeology.

Large and commodious rooms have been secured for the use of the school and they will be fitted up with all the improvements that long experience and careful study can suggest. The beginnings of a collection of photographs and casts have already been formed and provision made for securing a proper collection of books and drawing models. Arrangements will also be made for practical work, under the supervision of the university's own instructors. The plan of the work of the school, as here outlined, is a broad one, but it is impossible to undertake it on a less generous basis. Though the preliminary announcement has but just been made, the future prospects of the school point to a successful future.

An interesting calculation indicating the prospective growth of travel on the Brooklyn Bridge has been made based upon the continuance of present conditions. The total number of passengers in the year ending March 1, 1890, was 35,000,000, an increase of 5,000,000 over the year preceding. This rate of progression would give 50,000,000 in 1900, 60,000,000 in 1915, and about 70,000,000 in 1935. But it is not at all likely that the carrying capacity of the bridge can be increased to accommodate any such number of passengers, and new bridges and tunnels will provide other means for crossing the strait separating Brooklyn from New York.

The commission appointed to consider the question of coal waste in the State of Pennsylvania, wishing to make their investigation as comprehensive and exhaustive as possible, are distributing circulars with a view to obtaining a record of the results of practical experience, so as to diminish in the future, as far as possible, the waste and encourage the utilization of what are now waste products. The circulars invite an expression of views upon a number of subjects, a list of which is given. The divisions of the subject are Geological and Statistical Waste, Waste of Producing and Marketing, and Utilization of Coal Waste. The chairman of the commission is J. A. Price, Scranton, Pa., who will be glad to hear from any one who is interested in the matter.

HARDWARE.

The Condition of Trade.

Reports from all sections of the country show a satisfactory condition of business, with prospects for unusually active trade during the remainder of the year. Collections are not as prompt as could be desired, but this state of affairs will probably change with the movement of wheat and other crops. Rains are reported, which have encouraged farmers in many sections and stimulated trade in a corresponding degree. There is an absence of speculation, purchases being for legitimate wants. The volume of business is reported as being equal, or in excess of the same period last year.

Chicago.

(By Telegraph.)

Hardware.—Jobbers agree in reporting an increasing demand for all classes of seasonable goods. The time of year has now passed in which the fate of fall trade is decided, and the prospects are good for a continuance until Christmas of the good business now in progress. Harvest being over in the Northwest, the influence is felt of the demand from farmers for all kinds of staple goods. Shelf Hardware is as active as ever. Heavy Hardware jobbers say they never knew such an August as that just ended. It was the very largest month in the history of some houses. Orders coming in now have a very satisfactory snap to them. Buyers do not ask for prices, but order goods for prompt shipment, because they must have them at once. The scarcity of Nuts, caused by the recent strike in the factories, still continues. Prices are firming up on quite a number of articles, but a pronounced advance has been made on Tin Plates of 25¢ and upward per box. Freight rates from the East were advanced Monday, and a corresponding advance might have been expected on the goods affected, but no general change has been made in that direction.

Nails.—Jobbers are making unusually heavy shipments of both Cut Steel and Wire Nails. Prices are firmly maintained, but Wire Nails are a little stronger than Cut, if a comparison can be made. Quotations are \$2.05 for Cut and \$2.65 for Wire, with 5¢ off for carloads. Factory prices are strong for Wire Nails and good orders are being entered at \$2.55 to \$2.60, Chicago. Cut Steel Nails are in fair demand from factory and a very active trade is confidently expected before long. Meanwhile prices are being shaded on high averages, and \$1.85, Wheeling, for ordinary specifications, is quoted as a starting point for negotiations.

Barb Wire.—This branch of trade is in peculiar condition. The demand is quite heavy and Rods are scarce and dear, so that manufacturers would seem to be justified in asking higher prices, but they are renewing contracts on very close to spring prices. Competition between them is evidently too sharp to permit advantage

to be taken of the certainly favorable conditions prevailing. Jobbers quote \$2.90 for Painted and \$3.50 for Galvanized and are not inclined to make discounts for carloads. As an evidence of the heavy trade now doing in Barb Wire it may be stated that on August 30 a special train composed of 21 cars loaded with Barb Wire exclusively was started for Texas by the Baker Wire Company, of this city. The train was sent by way of the Chicago and Alton and the Missouri, Kansas and Texas railroads. The Wire shipped is known as the Baker Perfect Barb.

Philadelphia.

SUPPLEE HARDWARE COMPANY.—Trade continues without any material change since our last report, the volume being quite equal to the preceding two weeks, and in excess of the same period last year. Prices remain without any change, and stocks in the hands of jobbers for the fall trade are in fair condition.

Baltimore.

CARLIN & FULTON.—The buyers who are in the city and the numerous mail orders received make business active, but as usual at this season cash transactions are rare with the Southern trade. Orders for imported goods are difficult to execute, owing to the unsatisfactory condition of the Foreign market, as to American goods.

Cleveland.

THE W. BINGHAM COMPANY.—We can report at the present time continued prosperity in the Hardware trade in this section, with prospects increasing for an unusually active trade for the balance of the year. Farmers are showing a tendency to hold on to their wheat for higher prices, but owing to the present high prices for all kinds of produce there is a good feeling among country merchants. Goods are moving fairly, and a fair amount of money is in circulation, although collections are not what they should be at the present time—a condition of affairs which will change as soon as the wheat is marketed. Prices are well maintained, and a feeling is prevailing that goods have not yet reached their highest point, there being a disposition among the trade to stock up before further advances take place.

San Francisco.

HUNTINGTON-HOPKINS COMPANY.—Regarding the condition of trade on this coast, we have nothing of any particular moment to report. The real estate and building markets are both quite active; trade in the interior is fully up to expectations and increasing right along. We have also to note in the building line a very decided increase in the demand for Hardware of a high order. There is also a very marked change for the better in collections, money beginning to move quite freely. We expect that this will continue for the next two or three months, and that during the same time the volume of trade will increase very materially, as

our severe winter of last year was a lesson, that our interior merchants are not likely to forget very soon.

St. Louis.

There is hardly any noticeable change since our last report. The volume of trade continues to be large, and jobbers claim that the summer business just closing has been the largest for years. The outlook for a large fall trade is very encouraging, and indications point to a heavy business from all sections. The Southwestern trade which is virtually owned by St. Louis has been unusually gratifying, and the crop outlook, which was so unpromising two weeks ago, has been materially improved by several heavy rains which have visited this section in the last ten days. Prices are generally adhered to on all staple lines, and collections are up to the standard.

Portland, Ore.

FOSTER & ROBERTSON.—The jobbing trade of Portland still continues in a very healthy condition. Orders are coming in quite freely from travelers, while mail orders are fully as good, if not better, than at any time this year. One very satisfactory feature of trade is the total absence of a speculative tendency and a disposition to buy only as wants require. This leads to an even and steady trade, which is much less liable to break stock, and therefore much easier to provide for. The demand for Pumps, Gas Pipe, &c., has been very active, and bids fair to continue so until the fall rains set in. Orders for Tin Plate, Sheet Iron and kindred goods have been liberal. This is especially true of Galvanized Sheet Iron, which is now a very scarce article in this market. There is a constantly increasing demand for a better grade of Tools, particularly for Crosscut Saws, Axes, &c., which enter into the logger's trade. The trade in Hay-making and Harvesting Tools has been excellent, except, perhaps, in Grain Cradles, the sale of which has been lighter than usual, owing to the very small amount of tall grain. Local retail houses report trade as very active, much better than in the spring, and from the amount of building now under way the chances are good for a continuance of the same until bad weather sets in, which may not come until January 1. Collections are steadily improving, although there has been little or no movement of crops as yet, which indicates that money matters will be comparatively easy when grain is generally marketed.

St. Paul.

FARWELL, OZMUN, KIRK & Co.—The wheat crop of the Northwest is pretty nearly harvested and reports from a large portion of the territory indicate an average yield, though the quality is not up to the standard, and there will be little "No. 1 Hard" this year. With the increase in acreage and better prices now prevailing, however, the farmers will realize more money from their products than for a number of years past, which means better collections and a larger volume of fall business for the country merchants. It will be some time yet before the whole-

sale trade will feel the effects of this, as the marketing of the crop is largely postponed till the fall plowing is done. Business for the month of August has been about up to the average, while collections have been better than expected. We look to see a good increase in orders during September, as country merchants feel safe in stocking up now that the crop is assured, and we expect to realize better prices for the general line of Hardware than have prevailed in some time past. Business in the Twin Cities has been exceptionally dull for the past month, the retail dealers not being willing to buy beyond their wants from day to day.

Omaha.

LEE-CLARKE-ANDRESEN HARDWARE COMPANY.—We have to report a well defined increase in the volume of business for the past two weeks, and it may be said fall trade has fairly "got the word." Jobbers, as a rule, are sanguine and pleased with the general outlook. Notwithstanding the drawback of shortage of crops, as reviewed in our last report, the enhanced values of all farm products will, in all probability, offset the shortage referred to. The remarkably close and stringent condition of the money market in New York and other large financial centers is regarded with some apprehension, and if prolonged will probably exert a depressing influence on Western business. However, this stringency has not yet reached as far West as this market, and for that matter is not expected. The opinion prevails that this condition is only temporary, and that the monetary situation will assume its normal condition in a short time. It is to be hoped that these views will be realized. Collections still continue in satisfactory shape, and as yet show no appreciable influence of a close money market.

Louisville.

W. B. BELKNAP & Co.—We can still report a healthy condition of business both as to orders and collections. Recent rains throughout this section have done much to bring forward the late crops and to insure ample fall pasturage. Notwithstanding that most of the factories have gone to work in good earnest with the advance of cool weather, the supply of goods has not in any way proved more than sufficient for the active demand evident on all sides. At the same time there is no special reason to advance prices rapidly, so that buyers feel confident of all values. Any talk of panics or future disasters while prices are held at their present low level is unreasonable. The bubble can only burst after the bubble has been formed, and so far we have nothing but solid ground beneath our feet. Among articles noted as scarce are Galvanized Iron and Bar Iron. The long continued cheapness of Iron has led to its use in many ways not before thought of, and its adaptation to a greater variety of uses is the most encouraging sign for the future. Altogether the outlook is one to felicitate ourselves on both from the standpoint of

manufacturer and consumer. One hopeful sign of the times is the repudiation of the new bill of lading by some of the leading railroads. It will result, we are sure, in all of them following this more reasonable course. There can be no advantage in such a one sided document, all the more distasteful since it is too large to go into any of the ordinary files now in use. An interesting contest is now in progress here between some of the large manufacturers, as shippers and receivers of freight and the Car Service Association, some of whose exactions are too expensive to be borne without remonstrance. When gentlemen get together who feel invested with a certain amount of authority, and attempt to control another class whose cause is not heard, the result is apt to be one sided and eventually inoperative, as must be the present case.

Boston.

BIGELOW & DOWSE.—The month of August just closed has shown a very satisfactory amount of business, and which is considerably in excess of the same month last year. Prices are being well maintained by the trade. Many manufacturers are demanding higher prices for their goods and the retailers seem to welcome the firmer feeling. The market price for Wire Nails is \$2.75 base, but the price is shaded more or less. Our market on Steel Cut Nails is \$2 base, and the price is also shaded in good lots. No one seems to complain of the present price for Axes, (\$7.50), and there is little reason they should, as the prices will be advanced when the old stocks are disposed of. The outlook for a good trade this fall is very bright. The salesmen are fresh from their vacations now and September sales will be large.

Cut Nails.

The New York Cut Nail market has not shown any special features during the past week, the irregularities alluded to some weeks past having disappeared. We quote carload lots of Iron Cut Nails \$1.75 to \$1.85, on dock. The growing difference in price between Cut Nails and Wire Nails should soon tell in favor of the former.

Wire Nails.

The market is quite active and steady, sellers showing a disposition to mark up prices. We quote carload lots on dock \$2.50 to \$2.55, and small lots from store \$2.60 to \$2.65.

Miscellaneous Prices.

E. C. Atkins & Co., Indianapolis, Ind., wish us to correct the price for No. 6 Handles, as given in their circular quoted in our issue of August 21. These Handles should be 14 cents per pair instead of 13 cents.

The price of Sheet Lead, Lead Pipe, &c., was advanced, September 1, to the following figures, subject to the usual discounts:

	Per pound.
Lead Pipe.....	7½¢
Sheet Lead.....	8¢
Tin Lined Lead Pipe.....	15¢
Block Tin Pipe.....	40¢

Consolidation of Shot Manufacturers.

A meeting was held in Chicago last week for the purpose of forming a company of the 16 Shot Tower companies of the United States, with a capital of \$3,000,000; incorporated under the laws of Illinois, with headquarters at Chicago. The title of the new company is the American Shot Association. It is proposed that all the plants be bought outright for stock in the new association, and be a complete consolidation under one central management; the companies taking stock surrendering their individual existence. Their individual capital stocks will be canceled, each becoming a branch of the American Shot Association, and will be merged into the association at a valuation placed by an appraising committee, appointed some time since, who have just completed this feature of the work. The following are the Shot Tower companies of the country:

BAILEY, FARRELL & Co., Pittsburgh.
CHICAGO SHOT TOWER COMPANY, Chicago.
CINCINNATI SHOT WORKS COMPANY.
COLWELL LEAD COMPANY, New York.
COLLIER SHOT TOWER COMPANY, St. Louis.
CONTINENTAL SHOT WORKS, Kansas City.
GULF SHOT AND LEAD WORKS, New Orleans.
LEROY SHOT AND LEAD MFG. COMPANY, New York.
MERCHANT'S SHOT TOWER COMPANY, Baltimore.
NORTHWESTERN SHOT AND LEAD COMPANY, Omaha.
RAYMOND LEAD COMPANY, Chicago.
JAMES ROBERTSON & Co., Baltimore.
THOMAS W. SPARKS, Philadelphia.
SPORTSMAN SHOT COMPANY, Cincinnati.
ST. LOUIS SHOT TOWER COMPANY.
TATHAM & BROTHERS, New York and Philadelphia.

A meeting is to be held in Chicago this week to perfect the organization. We understand that two or three of the largest and most prominent of the companies decline to join the association. They object to making a transfer of their business to the consolidation, having large interests apart from the mere manufacture of shot, which it is proposed to control. Those who stand out do not, however, express any intention to fight the association, but to operate in harmony with it as far as possible.

Items.

The Stanley Rule and Level Company report the sale of over 600 dozen of their Patent Duplex Levels, first introduced to the Hardware trade in January of this year. The manufacturers say that the ready sale for these Levels is not so much because they can be retailed at a low price, as that they are exactly what mechanics want.

The American Wire Nail Company, Covington, Ky. and Anderson, Ind., are busily engaged in rebuilding their Wire Nail plant, which was recently destroyed by fire at the latter point. The new buildings should have been completed at the present time, but unforeseen delays upon the part of the contractors prevented. In the interval all orders are being promptly filled from their Covington, Ky. factories.

In the special notice on page 63, Haydock & Bissell, 12 Murray street and 15 Park place, New York, announce a large and peremptory trade sale of Hardware, Edge Tools, House Furnishing Goods, Stamped Tinware, &c., to take place Tuesday and Wednesday, September 9 and 10. This sale will include a large and

varied stock of goods direct from the manufacturers, comprising in part an extensive assortment of Hammers, Axes, Hatchets, Screws, Files, Saws, Door and Pad Locks, Braces, Curry Combs, Rules, Chisels, Planes, Door Knobs, Screw Drivers, Brushes, &c., as well as a large and desirable line of Enamelled Tea and Coffee Pots.

The Colby Wringer Company, Montpelier, Vt., with salesrooms at Boston and Chicago, report that the demand for the Colby Improved Wringer, which they have manufactured for the past 15 years, is steadily on the increase, and that the sale of their manufactures generally in 1889 were nearly double those of 1888. Their Premium Wringer, patent on which was issued August 12, 1890, is referred to as entirely new and as appreciated by the trade. Their export trade has grown to considerable proportions during the past two years. They are still manufacturing the Colby Little Washer, which has been favorably known to the trade for some 15 years.

Mailler & Quereau, 51 Stone street, New York, of the Australia and New Zealand Kangaroo Line, send notice that they have chartered the bark Concordia, 652 tons register, to load for Dunedin and Lyttelton. This vessel will be in her loading berth, Pier 10, East River, on or about September 8, and will have prompt dispatch.

We call attention to the advertisement of the White Cycle Company, Westboro, Mass., on page 67 of this issue, manufacturers of the Broncho Safety Bicycle. These wheels were put upon the market in 1889, their advent being late, rendered so by delay in the completion of their factory and from other causes. The demand has been so great for the Broncho Bicycles, it has been necessary to enlarge their factory, and to this end ground has been broken for an extension of the plant to three times its present size, to be equipped with the best machinery, especially adapted to their business. All fits are made to gauge, and no variation exceeding $\frac{1}{16}$ inch is permitted; thus all parts are interchangeable. This season they have put on the market two weights of the same wheel—namely, Broncho Roadster and Broncho Light Roadster.

A notice received from Nashville, Tenn., August 29, 1890, states that the partnership heretofore existing between H. S. Jackson and W. I. Cherry, under the firm name and style of H. S. Jackson & Co., has been dissolved by mutual consent, Mr. Cherry retiring from the firm. Mr. Jackson will continue the Iron and Steel brokerage business under the same firm name of H. S. Jackson & Co.

The H. A. Williams Mfg. Company, of Boston, have opened a New York office at 55 Fulton street, under the management of Mr. D. A. Goodrich. A complete stock of their line of Oilers will be kept on hand at this office.

The full powered steamship Karlsruhe, 5200 tons register, Kessler commander, will sail October 8, to Australia. Cargo will be received at North German Lloyds' piers, Hoboken, from September 15 to 25, and thereafter at Prentice's wharf, Brooklyn (adjoining Wall street ferry), until October 7, for Adelaide, Melbourne and Sydney, carrying cargo deliverable at all these ports on favorable terms and under through bills of lading (transshipping by steamer) to Brisbane and New Zealand ports. The Karlsruhe was built in 1889 by the Fairfield Shipbuilding Company (John Elder & Co.), builders of the world renowned steamships Arizona, Alaska, Umbria, Etruria, and of vessels of the Orient

Steamship Company and North German Lloyd Lines, has triple expansion engines, will steam direct to the port of Adelaide, and is confidently expected to make the run in 40 to 45 days. She has very superior accommodations for passengers, and is one of the finest steamships engaged in any trade. For freight, passage and further particulars apply to R. W. Cameron & Co., 23 South William street; Mailler & Quereau, 51 Stone street; H. W. Peabody & Co., 58 New street; Arnold, Cheney & Co., 158 Water street.

The Union Metallic Cartridge Company, Bridgeport, Conn., and 17 and 19 Maiden lane, New York, have added to their list of Military and Sporting Cartridges the Marlin Safety Cartridge for the New Model "89" Marlin, 32, 38 and 44 calibers, made by the Marlin Fire Arms Company, New Haven, Conn.

The McMullen Woven Wire Fence Company, manufacturers of Woven Wire Fencing and Gates, Chicago, Ill., have recently added machinery that will produce 4 x 8 mesh goods in No. 12 and even No. 11 Wire. We believe that these are heavier than have ever been woven before by machinery.

The Pike Mfg. Company, Pike Station, N. H., have nearly completed their Scythe-stone mill at Evansville, Vt., to take the place of that burned last February. The new building is 140 feet long, 60 feet broad and two and a half stories high, and will be equipped with the best and most approved machinery for making Scythe-stones, having five gangs and a large rubbing bed with a large assorting and labeling room, and, taken altogether, it is thought to be the most thoroughly equipped plant of the kind anywhere. They report that their business for the first six months of this year showed an increase of more than 20 per cent. over that of last year. Their advertisement on page 65 of this issue will interest the trade.

Countermanding Orders.

The question as to the wisdom of manufacturers continuing to permit jobbers to place orders with them for future delivery at a stated price, with the privilege of countermanding these orders in whole or in part if, owing to the condition of the market, it is to their advantage to do so, continues to attract attention from the trade. It is obvious that the practice in question touches many interests and is undoubtedly owing, in the extent to which it is carried, in large measure to the animated competition which leads manufacturers to give any inducements in their power with the view of securing business. The question as to whether or not the method which has become so firmly rooted in certain lines of trade will be discontinued doubtless depends upon whether or not it will be to the interest of manufacturers to refuse to make such liberal concessions to the interests of their customers. There is some reason to think that there is little probability that the practice will be abandoned, as intimated in the following letter from a well-known jobbing house, who at the same time concede that the custom is unbusinesslike:

We do not consider the entering of blanket orders by manufacturers, with the privilege of taking such portion as may be desired, and canceling the balance just before an anticipated advance, is business-like or mercantile, and frequently makes a very unpleasant competitor of a party entering such orders. We, however, give

the manufacturer credit of being able to manage his business affairs as it best pleases him, and feel that this manner of doing business will be practiced for all time to come.

From Portland, Oregon, we have the following clear and forcible argument from the jobbers' standpoint in favor of the placing of orders for future delivery which may in part at least be canceled if the jobber's interests, owing to special circumstances, require it. It will be observed that our correspondent covers the ground carefully, viewing the matter fairly and reaching the conclusion that it must remain with each manufacturer to decide for himself, in view of the knowledge of his customers and the special circumstances attending each transaction:

Of course this question, like everything else, has two sides to it, and no doubt both will be ably championed. The conditions of trade in this country are, in our judgment, such as, to make it very necessary for the jobbers to have the privilege above mentioned, as owing to the remoteness from the markets and the necessity of our shipping a considerable portion of our goods by sail via Cape Horn, also the length of time necessary to get shipments here by rail, it is necessary that the jobbers on the Pacific Coast should have the option on certain lines of goods, so that they can send their salesmen out into the field and secure orders for at least a portion of the contract quantity of goods before time for delivery. The contracts may be entered into by the jobbers early in the season before the harvest is assured, and if later in the year unfavorable weather should cause an entire or partial failure of the crops, and the jobber finds himself unable to place the goods he had contracted for with the manufacturer earlier in the season in anticipation of an advance in prices, it would, of course, work a great hardship to the jobber to be obliged to take them, and we think almost any manufacturer would, under such circumstances, consent to a cancellation of a part at least of the contracted quantity. The above conditions are probably peculiar to the Pacific Coast trade, and would not have as great weight in other sections nearer manufacturing points. We think that undoubtedly the fact of the manufacturers giving the jobbers the privilege of canceling their orders largely increases the sale of the goods for the manufacturer, as the jobber, feeling sure of being able to fill orders for the goods, sends his travelers out into the field to push for the trade and secure orders, and in this way the volume of business is considerably increased, as if the jobber felt that he must first provide the stock before he undertook to sell the goods, he would naturally be more cautious to make sure that he had the stock and could fill the orders his salesmen might send him, while at the same time business prudence would prompt him not to overload himself on any one line of goods, fearing a drop in the market. So that we think the volume of business is undoubtedly increased by the method mentioned.

It is, however, we think, to be deprecated in some respects, as it promotes a speculative action on the part of some dealers. If the price goes up and they can sell the stock out at an advance they have made a good thing, while if it goes down they can cancel the order and let manufacturer hold the stock. So far as we can see, from our standpoint, it is a matter that every manufacturer must determine for himself. If the manufacturers know their customers thoroughly, and know that they are conducting their business on sound business principles, and are

contracting for only such quantities as their legitimate trade usually requires, it would be simply an act of justice on the part of the manufacturer to permit the jobber to cancel a portion or all of his contract order if the conditions of trade should be such, from crop failure, stagnation of business or other causes, as to prevent the jobber from disposing of the contracted quantity of goods. While as the manufacturer's trade would extend generally all over the United States, he could dispose of the goods without loss in some other portion of his trade, while the jobber, if forced to take the stock he had contracted for, would oftentimes sustain a heavy loss, and in many instances have his business severely crippled, as his trade is almost entirely local. As before stated, our opinion is, of course, of but little weight or moment, as we are so remote from the regular channels of trade that the causes and conditions affecting business here are largely local in their nature, and what would be applicable to trade here would naturally not apply to trade in the Eastern, Middle, Western or Southern States. Still, summing it all up, our view would be that it is a matter almost entirely for each manufacturer to decide for himself, and that knowing the customers he deals with he could easily investigate the conditions of trade affecting such customers, and decide whether it was proper to permit a cancellation of the contract in whole or in part from legitimate business reasons, and not as a purely speculative venture.

Catalogues, Price-Lists, &c.

The Nubian Iron Enamel Company, Chicago, Ill., send the September number of their monthly callendars, accompanied by a small book of testimonials.

Herkner & Stine, 8 Ferry street, New York, manufacturers of Pure Oak Tanned Leather Belting, Electric Light Belting, Lace Leather, &c., send us their price-list of Leather Belting, Flat, Solid or Twist, also of Cut Lace Leather.

Baker & Hamilton, San Francisco and Sacramento, issue extra pages to paste into their No. 23 catalogue. These leaves relate to Axes and Electric Bell Sets.

Johnson Bros., Aurora, Ill., issue illustrated circulars descriptive of their Tire Bolter and Cutter. This is adapted to bolting and unbolting vehicle wheel tires and severing the tire bolt after the nut is screwed on, being two machines combined in one.

The Peck, Stow & Wilcox Company, 27 Chambers street, New York, send extra leaves to paste in their 1885 catalogue. These show Shears for cutting heavy metal, combined Bench and Slitting Shears, Forming Machines, Notching Machines and Shelf Brackets; also an extra sheet illustrating their Little Giant Meat Cutters.

The Cincinnati Stamping Company, Cincinnati, Ohio, issue a very tastefully executed catalogue devoted to Coal Vases, under date July, 1890. The pages are tinted, leaving a white margin round the edge, which produces a marked contrast with the illustrations of the Vases, which are in black. Twenty-two cuts are given showing various designs, with and without rack attachment. Many of these are decorated with extra fancy all hand ornamentation.

The Cleveland Wheelbarrow and Truck Company, Cleveland, Ohio, manufacturers of Wheelbarrows, Trucks, Skids and Pounds, issue a catalogue illustrating these goods. The Wheelbarrows are made in a variety of styles, many with solid Steel Trays. Particular emphasis is put

upon the strength, durability and economy of Wright's Improved Malleable Iron Wheel, which is used on many of their Barrows. The claim is made that the axle when worn can be replaced by any common smith at a small cost.

Mack & Co., Rochester, N. Y., sole manufacturers of genuine D. R. Barton's Planes, Edge Tools, &c., issue an 1890 illustrated catalogue. An extra leaflet calls attention to new goods not in previous catalogues. These are solid Cast Steel Tanged Slicks, Trowel Shank, Beveled Back, Handled Stair Builders' Chisels and Gouges, Beer Keg Chamber Knives, Ship Scrapers and Butcher Tools. The Butcher Cleavers they are handling in an entirely new way.

O. Lendemann & Co., 81 Beekman street, New York, issue an 1890 illustrated catalogue of the Bird Cages manufactured by them. These include Round and Square Cages, both in japanned and brass; Robin Cages, Parrot, Breeding, Lark, Traveling Cages, &c. They also show many novelties in the line of Cage Sundries.

Martin Logan, 65 Duane street, New York, issues an illustrated circular, descriptive of Logan's patent Stall Drain for stables. The claims for this drain are economy, durability and cleanliness. In the construction of the drain there is an entire absence of nails, screws or bars, and it is alluded to as a positive preventive of spinal meningitis and other diseases to which a horse is exposed by reason of defective drainage and imperfect ventilation.

John S. Leng's Son & Co., 4 Fletcher street, New York, importers and dealers in Iron and Steel, patent weldless cold drawn Steel Tubes, &c., issue circulars descriptive of goods in the Hardware and railway line. They show Lansdell's Patent Steam Syphon Pumps, Leng's Improved Lever and Cam Gate Valve, Lansdell's Portable Railway Syphon and cold drawn Steel Tubes. These Tubes are used where lightness, strength, uniformity and durability are required. They are made from solid blocks of specially prepared and tested Steel, and are drawn cold without weld or seam. The list of these Tubes is referred to as containing a greater number of sizes than former ones, of which they keep in stock, in moderate quantities, almost all of the leading sizes, the time required to fill orders on importation being about 60 days.

C. M. McClung & Co., 188 and 190 Gay street, Knoxville, Tenn., issue a descriptive price-list of Guns, Ammunition, Reloading Tools and Sporting Goods.

The Forsyth Scale Company, Youngstown, Ohio, issue a catalogue and illustrated price-list of the Scales manufactured by them. Attention is called to their Standard Counter Scale. It is referred to as having no weak places, such as malleable loops, &c., the bearings being steel on steel throughout, and the beam support being quite a distance from the platform, allows large packages to be weighed, and prevents the scoop from coming in contact with it. These advantages make it desirable for grocers' use.

The Hagerstown Iron Works, Hagerstown, Md., issue a catalogue of their Imperial Thresher and Separator, Saw Mills, Shingle Mills, and other agricultural implements. The Imperial Thresher, Separator, Cleaner and Bagger is referred to as a new production, possessing many desirable features. Leaflets are sent, illustrating the U. S. Feed Cutter, I X L Improved Lifting Jack, U. S. Corn Planter, and the U. S. Corn Sheller.

Suspended Price-Lists.

The inconvenience of having price-lists hanging to the divisions between the shelves, or having them lay around on the counters or ledges, where they get soiled and possibly lost, is so great that some of our more ingenious hardware friends have arranged their price-lists, as shown in the accompanying cut, by suspending them with a counterbalancing weight on the other end of the string, which string passes through two screw pulleys in the ceiling. As will be seen, the price-list comes down over the center of the counter, and can be reached from either side. When pushed up it is above every one's head, yet within easy arm's reach. Both sides of the holder can be utilized by lists, thus economizing room. It is desirable to have the list of the goods in an immediate neighborhood, or of the same class, on the same hanging

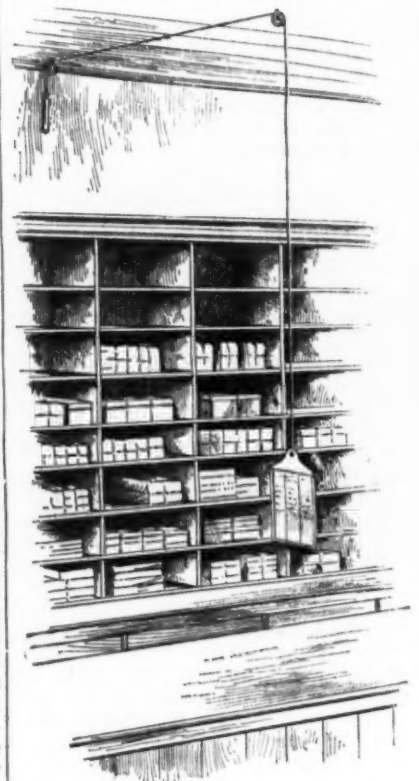


Fig. 434.—Suspended Price-List Balanced by a Weight.

holder, the holder being made large enough to accommodate as many as needs be. Thus if screws, tacks, screw eyes and screw hooks were near each other on the shelves, the price-lists could all be put on one holder. These holders can be made of tin or wood, and the lists fastened in or on them. If of tin, the edges are turned to hold the lists on one side, and corresponding cleats soldered on the other side for the same purpose. Many convenient arrangements as inexpensive as this can be brought into use, adding much to the pleasure and ease of doing business. When you once start making these little improvements about the store, you will be surprised to find how readily they suggest themselves to one's mind.

Hardware Drawings.

With the artistic excellence of modern hardware and the vast ranges of styles from which selection is to be made in the fitting up of a first-class residence there is great room for the display of taste, either upon the part of the architect or upon the part of the house owner. In many instances it is the pleasure of the house owner, or of some member of his family or friend, to assist in the selection of the

hardware, especially in the matter of door trimmings. Very often contracts are made by which the owner reserves to himself the right of selection, the builder simply putting in place that which the owner supplies. Almost every manufacturer of artistic door hardware at the present time provides special facilities for the display of his goods in order to enable architects with their clients, or the householder alone, to make judicious selection for the trimmings to be used in certain places. With this habit established in the community and with the fashion of the householder indicating his taste and preferences, it is incumbent upon the architect to provide such drawings as give the hardware manufacturer a clear conception of just where the required pieces go, and how

Exports.

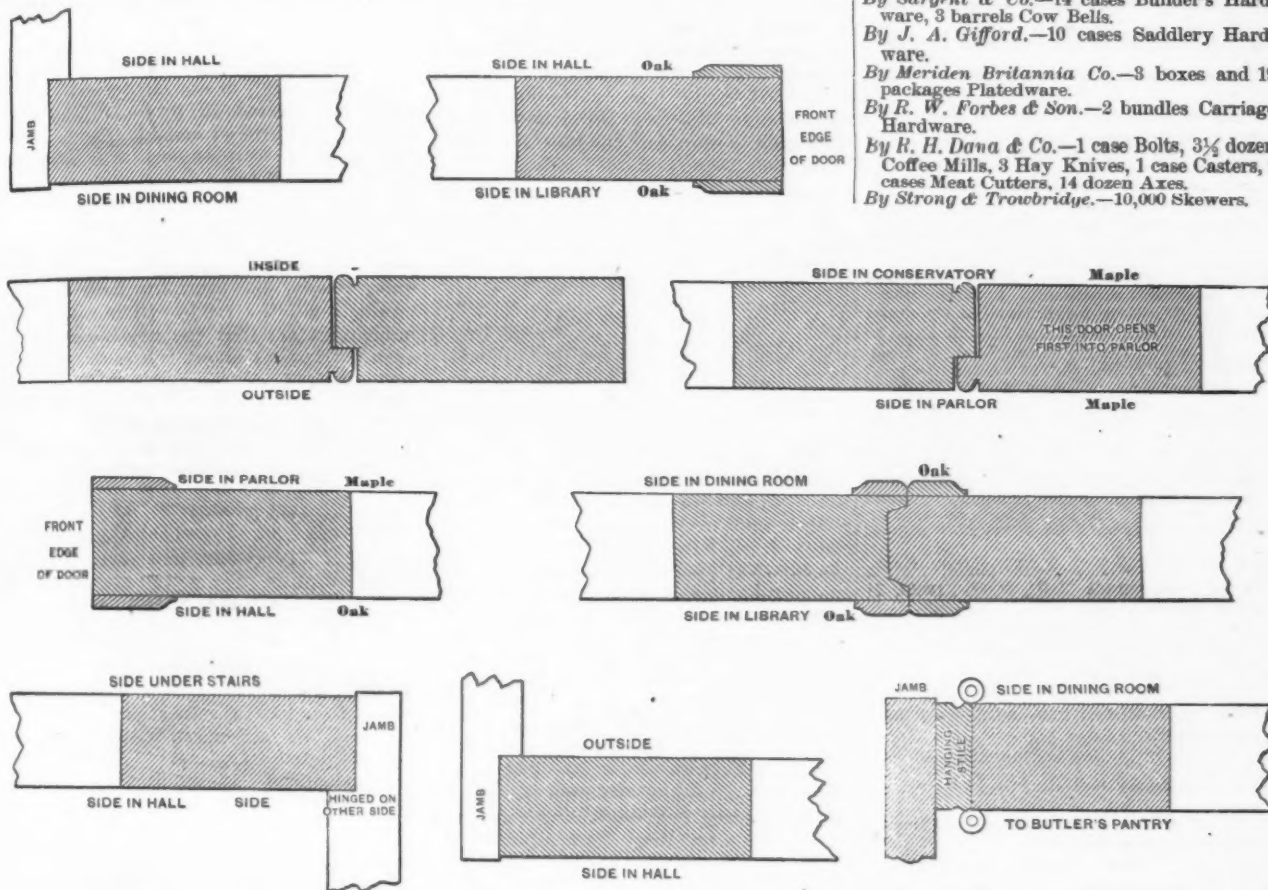
PER BARK AUSTRALIA, JULY 30, 1890, FOR SYDNEY, N. S. W.

By Bradley & Hubbard Mfg. Company.—21 packages Lamp Goods.
By H. A. Disston & Sons.—887 pounds Hardware.
By Collins & Co.—46 dozen Edge Tools, 190 dozen Edge Tools.
By H. W. Peabody & Co.—¼ dozen Wringers.
By R. W. Forbes & Son.—5 packages and 1 case Carriage Hardware, 2 packages Carriage Hardware.
By Sargent & Co.—7 cases Hardware, 13 packages Castings.
By W. H. Crossman & Bro.—3 gross Broilers, 3½ dozen Churns, 9 dozen Fly Traps, 6 dozen Spades, 8 Churns, 10 cases Hardware, 18 dozen Handles.

48 dozen Fly Traps, 12 dozen Mouse Traps, 20 boxes Tacks, 8 Scales, 5 gross Traps, 24 boxes Tacks, 588 pounds Nails, 2 packages Washita stones, 12 dozen Traps, 30 dozen Locks, 9 dozen Lamp Ware.

PER BARK EMPIRE, AUGUST 1, 1890, FOR ADELAIDE, AUSTRALIA.

By Edward Miller & Co.—2 barrels and 2 casks Lamp Goods.
By Lalanc & Grosjean Mfg. Company.—5967 pounds Hollow Ware.
By Meriden Britannia Company.—2 boxes and 1 cask Silver Plated Ware.
By Russell & Erwin Mfg. Company.—9 cases and 3 packages Builders' Hardware.
By Rogers, Smith & Co.—3 boxes Silver Plated Ware.
By Dunbar, Hobart & Co.—2688 pounds Nails.
By Peck, Stow & Wilcox Co.—195 pounds Tinsmiths' Machines.
By Joseph Dixon Crucible Co.—1318 pounds Crucibles.
By Sargent & Co.—14 cases Builder's Hardware, 3 barrels Cow Bells.
By J. A. Gifford.—10 cases Saddlery Hardware.
By Meriden Britannia Co.—3 boxes and 19 packages Platedware.
By R. W. Forbes & Son.—2 bundles Carriage Hardware.
By H. H. Dana & Co.—1 case Bolts, 3½ dozen Coffee Mills, 3 Hay Knives, 1 case Casters, 2 cases Meat Cutters, 14 dozen Axes.
By Strong & Trowbridge.—10,000 Skewers.



Hardware Drawings.—Sections of Doors for which Special Hardware is Required.

they are to be employed. This gives rise to a special requirement in the preparation of details. How this has been worked out by at least one architect is clearly shown by the engravings upon this page, which have been prepared from drawings made by S. C. Merry, for a residence to be erected for Mr. B. Head, at Islip, Long Island. The selection of hardware was made from the well known stock of the Yale & Towne Mfg. Company, and it is to the New York office of this concern that we are indebted for the originals from which these engravings were made and for the particulars upon which this article is based. The sections represent portions of the different doors in the house in question, for which special hardware was to be selected. They answer such questions as, how the doors swing; what their different faces are, so far as the kind of wood is concerned; whether they are sliding doors or doors of the usual variety; how they are rabbetted, &c. The drawings speak for themselves, and our readers will be interested in looking them over and seeing how carefully they comply with the well-known requirements in such cases.

By Strong & Trowbridge.—3 bundles Iron, 3 boxes Castings, 1 dozen Shot Cases, 2 gross Stampedware, 25 Hardware, 12 Boring Machines.
By Coombs, Crosby & Eddy.—1 dozen Scales, 2½ dozen Freezers, 5½ dozen Wringers, 26 cases Sad Irons, 4 1-6 dozen Wringers, 12 dozen Bird Cages, 25 dozen Hardware, 1 Bicycle, 3 dozen Carpet Sweepers, 25 dozen Tinware, 9 dozen Lemon Squeezers, 1½ gross Egg Beaters, 35 dozen Tinware, 10 dozen Tools, 30 dozen Planes, 48 dozen Tacks, 14 Stoves, 12 dozen Braces, 10 dozen Axes, 10 dozen Braces, 10 dozen Axes, 6 dozen Hoes and Rakes, 13 dozen Traps, 6 dozen Hardware, 36 dozen Door Springs.
By Arkell & Douglas.—1010 pounds Axes, 18 dozen Axes, 1 dozen Lawn Sprinklers, 4 dozen Levels, 6 dozen Plated Ware, 12 Springs, 20 dozen Cow Bells, 7100 Bolts, 1 dozen Jacks, 712 pounds Castings, 6 dozen Lamp Ware, 30 dozen Scythes, 1 dozen Lanterns, 4 dozen Squeezers, 14 dozen Hoes, 6 dozen Revolvers, 7 dozen Lanterns, 15½ dozen Knives, 886 pounds Nails, 6 Hammers, 1 dozen Plated Ware.
By V. Basanta.—6 dozen Hammers, 41½ dozen Saws, 12 Freezers, 69 dozen Granite Ware, 24 dozen Tinware, 7 dozen Plumbs and Levels, 2 dozen Wagon Jacks, 24 dozen Hammers, 18 dozen Wrenches, 12 gross Brackets, 200,000 Tacks, 16 dozen Braces, 2 dozen Choppers, 9 Air Guns, 49 Granite Ware, 10 dozen Spades, 1 dozen Wrenches,

By McLean Bros. & Fogg.—4 dozen Hammers, 12 dozen Harness Snaps, 3 dozen Lock 336 pounds Nails, 6 dozen Fly Traps, 12 dozen Mouse Traps, 1½ dozen Wringers, 4 dozen Hammers, 12 dozen Saws, 18 dozen Axes, ¾ dozen Wringers, 100 dozen Brackets, 9 dozen Wrenches, 43 pounds Whet Stones, 8 cases Hardware, ½ dozen Wringers, ½ dozen Rifles, 1 dozen Toy Banks, 24 dozen Axes, 18 sets Axes, 1 dozen Clamps, 2 dozen Money Drawers, 4 dozen Braces, 18,000 Bolts, 1 dozen Jacks, 2 dozen Shears, 6 dozen Prestoline, ¼ dozen Windmills, ½ gross Glass Cutters, 4 cases Granite Ware, 1 dozen Saws, 3 Air Guns, 9 dozen Drills, 3 dozen Razor Stropps, 7800 Bolts.
By W. H. Crossman & Bro.—2 gross Razor Stropps, 10 dozen Hay Knives, ¾ dozen Scales, 12 dozen Wrenches, 24 sets Sad Irons, 766 pounds Iron Bolts, 69 Pumps, 15 dozen Thermometers, 3 gross Traps, 18 packages Hay Rakes, 300 pounds Nails, 800 feet Wire Cloth, 2 dozen Grindstone Fixtures, 8 dozen Saws, 6 dozen Hardware, 10 dozen Spades.
By H. W. Peabody & Co.—42 packages Hardware, 26 cases Axes, 1 package Forks, &c., 3 cases Hoes, 29 packages Stoves, 2 cases Money Drawers, 14 cases Bolts, 2 packages Lampware, 22 packages Pumps, &c., 33,605 pounds Barb Wire, 87 packages Barrows, &c., 2 cases Hardware, 50 cases Wringers, 3 cases Tools, 1 case Lampware, 40 boxes Tools, 1 case Hardware, 8 packages Hardware, 1 case Stoves, 8 dozen Stampedware,

1½ dozen Wringers, 18 dozen Traps, 12 Mangles, 1 case Oil Stoves, 46 cases Wringers, 3 cases Mouse Traps, 3 cases Stampedware, 1 barrel Lampware, 29 Stoves, 7 packages Hardware, 1 case Stampedware, 6 dozen Hoes, 89 cases Tools, 3 packages Stoves, 5 cases Tools, 10 cases Meat Choppers, 4 cases Hardware.

By Arkell & Douglas.—37 dozen Snaths, 22 dozen Graniteware, 12 Stoves, 6½ dozen Wringers, 3 Saws, 1½ gross Traps, 6 dozen Forks, 1½ dozen Pumps.

By Mailer & Quereau.—18 cases Skewers, 26 cases Windmills, 2200 pounds Manila Cordage, 6 cases Agateware.

PER S. S. PRODANO, AUGUST 19, 1890, FOR SYDNEY, N. S. W.

By Collins & Co.—97 dozen Hardware.

By R. W. Forbes & Son.—24 dozen Mouse Traps.

By Meriden Britannia Company.—6 barrels Silver Platedware.

By New Departure Bell Company.—1 case Builders' Hardware.

By Hartman Mfg. Company.—2 crates Wire Door Mats.

By Rand Drill Company.—6 boxes Drill Machinery.

By Edward Miller & Co.—21 pounds Lamp Goods.

By Collins & Co.—227 dozen Handled Axes, Hatchets and Bush Hooks.

By R. H. Dana & Co.—1 case Bolts.

By Hartley & Graham.—82,000 Cartridges, 4000 Primers, 500 Shells, 1 Repeating Loader, 1 Rifle, 40 Revolvers, 5 Tools, 3 Rifles, 40 crates Tools, 109,539 Cartridges, 13,700 empty Cartridge Shells, 31,000 Primers, 250 Shells, 81,000 Wads, 2500 Cartridges.

By Arkell & Douglas.—8 dozen Platedware, 900 feet Leather Belting, 4 dozen Razor Strops, 20 dozen Rake Handles, 32 dozen Locks, 30 dozen Cow Bells, 7 dozen Bells, 20 dozen meat Cutters, 5 dozen Axes, 10 dozen Bush Hooks, 3 Churns, 416 pounds Castings, 40 dozen Locks, 4 dozen Locks, 62 dozen Saws, 1 gross Egg Beaters, 24 dozen Picks, 23 Pumps, 6 dozen Hatchets, 1062 pounds Nails, 20 dozen Oil Cans, 13 dozen Wrenches, ½ dozen Broilers, 1 dozen Fry Pans, 1 case Saw Sets, 1 dozen Pumps, 12 dozen Axes, 10 dozen Picks, 15 dozen Pulleys, 70 pounds Nails, 200 dozen Metal Polish, 6 sets Axles.

By Walter A. Wood.—80 boxes Mowers and Parts.

By R. W. Forbes & Son.—6000 pounds Manila Paper, 2000 pounds Nails, 24,000 Rivets, 24 dozen Mouse Traps.

By Collins & Co.—50 dozen Axes.

By Jos. Dixon Crucible Company.—637 pounds Lead Pencils.

By Edward Miller & Co.—15 packages Lamp Goods.

By Meriden Britannia Company.—4 packages Platedware.

By Perry Stove Company.—1620 pounds Stoves.

By Rogers, Smith & Co.—37 packages Platedware.

By Russell & Erwin Mfg. Company.—59 cases and 11 packages Hardware.

FOR ADELAIDE.

By R. W. Forbes & Son.—½ dozen Locks.

By Edward Miller & Co.—12 packages Lamp Goods.

By Meriden Britannia Company.—2 boxes and 10 packages Platedware.

Frenchmen want American pork. The Paris Journal Des Débats says prohibition is "unseasonable." The soundness of this conclusion is pointed out by Le Paris, which says: "If the measures of retaliation should be rigorously enforced it would cut off the sale of 400,000,000 francs' worth of French products annually. For such an interest it is well worth while to sacrifice something. The public health will not be damaged by admitting a few tons of American pork." Under the circumstances Frenchmen will swallow the pork and take the consequences.

The newest accession to the list of manufacturing works proposed to be located in Pittsburgh is the Peckham Car Wheel Company, of New York, whose works are at Kingston, on the Hudson. A controlling stockholder in the concern, John Hunter, Jr., has been for some time past examining localities. The operations of this company have so increased as to compel them to look for larger quarters than they now possess. The plant to be erected will cost about \$100,000, including the cost of the site.

REVIEW OF THE WHOLESALE MARKET IN PAINTS AND OILS.

It should be understood that the prices quoted in this column are strictly those current in the wholesale market, and that higher prices are paid for retail lots. The quality of goods frequently necessitates a considerable range of prices.

Paints and Colors.

The distribution by jobbers has again been on a fairly liberal scale, and in some instances represented as larger than during the preceding week. Manufacturers of the more staple articles also report a satisfactory movement, with sufficient improvement to warrant the statement that the fall season trade has already shown signs of starting in well. The late advance in prices of White Lead, followed as it has been by a rise on foreign Zinc White, tends to impart better tone to the market for those commodities, and the almost uniform steadiness of values of the leading lines of Colors also has a favorable bearing. However, it is a noticeable fact that no corresponding improvement in values of so-called cheap (adulterated) White Lead has taken place, and that Ready-Mixed Paints are also selling at old prices despite the enhanced cost of various crude materials. This is attributed to the large variety of the respective goods on the market and rather sharp competition among manufacturers. The indications are, however, those specialties will eventually be marked up more or less.

White Lead.—The advance in prices made by corrodors last week is firmly adhered to, and the chief outside brand of pure Pigment is also up ½¢ per lb. Jobbers' figures are correspondingly higher, but in the absence of any attempt by the "trust" to control prices at second hands the jobbers continue to fill small orders at the card rates for 5 ton and 12 ton lots. Cheap Leads are without change as to price, and rule as low now as they have at any previous time this year. Trade is of very fair volume and the demand as full, as it usually is at this period of the year.

Zincs.—Foreign Zincs have been advanced ½¢ per lb for dry and ¼¢ for Oil, with the Vielle Montague brands leading in the rise. The distribution is affected, if at all, by the addition to cost. For American Oxide the old range of prices prevails and the market retains very steady tone. The current movement of both domestic and foreign brands is of fairly good volume, and the market looks to be quite firm. The new prices for foreign are as follows:

Dry, Antwerp Red Seal.....	7½¢
Dry, Antwerp Green Seal.....	8¢
Dry, Paris Red Seal.....	7½¢
Dry, Paris Green Seal.....	8½¢

Discounts—1% for lots of 10 barrels, 30 days.
2% for lots of 25 barrels, 30 days.
4% for lots of 50 barrels, 30 days.

Ground in Poppy Seed Oil—	bbls.	In cans.
Red Seal, lots of 1 ton.....	9½¢	10½¢
Red Seal, lots less than ton...	10¢	10½¢
Green Seal, lots of 1 ton.....	10½¢	11¢
Green Seal, not less than ten.	10½¢	11½¢

Colors, &c.—On the general line of housepainters' colors old quotations prevail and grinders' stock is also very steady, as a rule. The demand, generally speaking, is fairly good, but not of unusual character. Ready Mixed Paints are selling fairly and former prices prevail for the various brands.

Miscellaneous.—Prices for Block Chalk on the spot remain steady in the absence of any large arrivals latterly, and lots for early shipment are also quoted with some showing of firmness. Whiting has steady movement at old prices, as does also Paris White, and Clays generally have fair sale at previous rates.

Oils and Turpentine.

There have been no important developments the past week in the market for Animal or Vegetable Oils. For that matter, general trade has hardly kept pace with the movement during the preceding week, and the demand, outside of the regular call for moderate quantities of goods, is rather light. However, the distribution is of seasonably good volume and large enough to keep prices steady all along the line. There are at present no signs of probable important changes in values in the near future, or of anything in the way of unusual movement of supplies.

Linseed Oil.—The situation is practically the same as outlined last week. Rumors of contemplated invasion of the Eastern markets by the Linseed Oil trust still have circulation, but these have so often been conspicuous in the past that they are given merely passing notice at the present time. City manufacturers meanwhile hold their prices firmly at 62¢ for domestic and 64¢ for Calcutta seed products, and the goods sell all around outside brands that are offered at about 4¢ less. The general demand is very fair.

Cotton Seed Oils.—The export demand for low grade refined has fallen off somewhat, and home trade inquiry at the moment is rather light also. Prices are quite steady, however, for both refined products and the crude article. Present indications are that the new season will open with prices about the same as current for spot goods, there being every sign of a large supply of raw material and probable heavy production of Oil.

Lard Oil.—No further change in prices has taken place, and the market is without new feature, save that the demand, while still very good, is not as lively as it was a week ago. Present make prime is selling at 51¢ @ 52¢, and Extra Winter at 53¢ upwards.

Fish Oils.—Crude Sperm and crude Whale Oils are firmly held at previous prices, but rather quiet. The higher grades of crude Menhaden are in very fair demand, but other qualities have limited call. Of the various refined products there is a very fair movement, with the former line of quotations ruling.

Miscellaneous.—Cocoanut Oils are very firm, at the advanced prices noted last week, and supplies are still under close control. Nothing new has transpired in the direction of concentrating the supply of Olive Oil, and purchases can be made at old prices. Palm Oil is steady, but quiet. Saponified has had rather better sale and is firmer.

Spirits Turpentine.—Prices have weakened about ¼¢ in the local market, and are slightly lower in the South also. The reaction is attributed to slow demand from the trade and absence of speculative interest. Present quotations are 40½¢ @ 41¢, according to style of package.

To show the extent to which railway consolidation has been carried on, the following classification of operating corporations is given in the last report of the statistician of the Interstate Commerce Commission, Henry C. Adams:

Corporations operating	No.	Aggregate mileage.	Proportion to total mileage.
Over 1000 miles ..	33	76,963	49.09
From 600 to 1000 ..	26	19,573	12.48
From 400 to 600	31	15,767	10.05
From 250 to 400	52	16,390	10.42
Less than 250	467	28,170	17.96
Total	609	156,863	100.00

All but about 17 per cent. of the total railway mileage of the United States is directly operated by 142 companies. During the year ending June 30, 1889, 26 roads, formerly reporting as independent operating companies had been consolidated under new names, and 39 had been merged into existing systems.

The Anti-Base Chimney Cap and Ventilator.

The Western Ventilating and Chimney Cap Company, 471 Milwaukee street, Milwaukee, Wis., are manufacturing a new



Fig. 1.—The Cap as Used on a Chimney.

style of chimney cap for which a patent has been applied. The illustrations herewith given show the cap as used on a chimney, Fig. 1, and as used for ventilating, Fig. 2. They are manufactured of the best quality of galvanized iron. The manufacturers claim that a cap of this construction will not obstruct the draft as a cap will with a base; that better ventilation and greater draft will be secured than with a base cap; that these caps do not rust nor collect creosote. Although the top of the chimney appears to

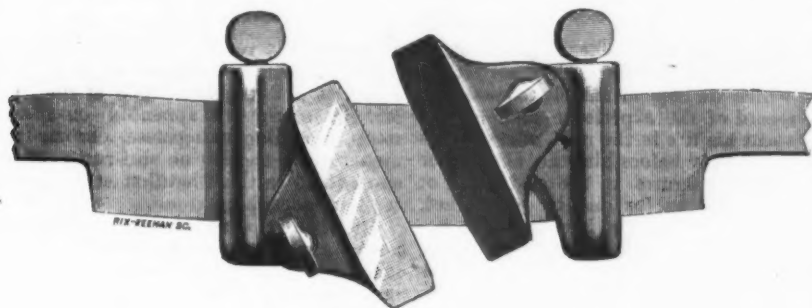


Fig. 2.—The Cap as Used for Ventilating.

be unusually open for a capped chimney, yet it is so well covered by this device that no rain or snow can enter it.

Humphrey Tool Company's Chamferer.

The Humphrey Tool Company, Warren, Mass., manufacturers of hardware specialties, are introducing a chamferer, which is



The Humphrey Tool Company's Chamferer.

advertised on page 75 of this issue and illustrated herewith. It is intended to be attached to any drawing knife for use in chamfering corners to any required width, and work extra fine on account of being able to set it any angle with the work on which it is used, thus allowing a shearing cut. It is referred to as making a smooth

cut on hard or cross grained wood. Goods are finished bronzed or nickel plated as desired.

The Colby Premium Wringer.

The Colby Wringer Company, Montpelier, Vt., with Western salesroom 68 Lake street, Chicago, Ill., are introducing their Premium Wringer, as illustrated by Figs. 1 and 2. This is in addition to their Colby improved wringer, which they

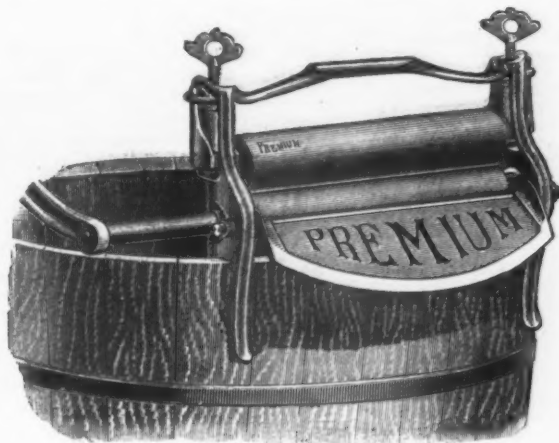


Fig. 1.—The Colby Premium Wringer.

have manufactured for the past 15 years. It will be noticed that the end or frame casting in Fig. 2 has been cut away to show the inner construction. This frame or end casting holds the upper roll, journal box for the same, springs, &c., and this casting also supplies the stationary outer leg; the inner movable jaw is provided with a bearing which carries the lower roll and has a slotted right angled extension, in which slot a crescent shaped cam acts. The cam bar, which serves as a frame for the apron, is hung on the tie rod (which passes through it at each end, and with the aid of the top bar holds the wringer together), and controls the clamping of the wringer to the tub, also the pressure upon the rolls. The working of the wringer is described as follows: Raising the apron to a vertical position causes the jaw to open, releasing the wringer from the tub and at the same time relieves the rolls from all pressure, thus preserving the elasticity of the rubber; the pressing of the apron down to a horizontal position produces the opposite effect—the cam passes its center and the wringer is held firmly to its position. The top screws serve to equalize the various thickness of staves in tubs, thus insuring a uniform

system of time-carded trains is in use which greatly expedites the dispatch of freight. Another timely publication is a copy of the Western freight classification issued by the Chicago, Rock Island and Pacific.

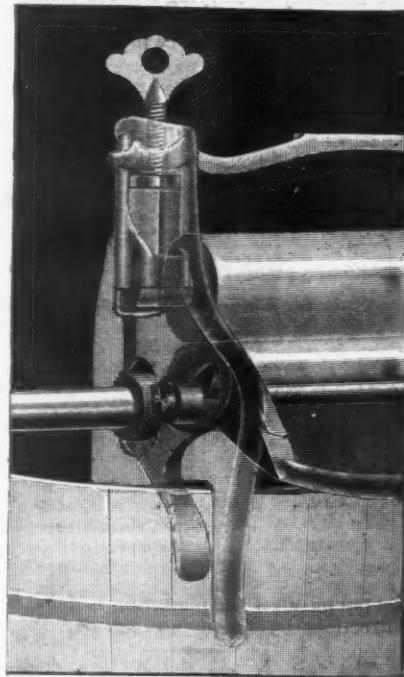


Fig. 2.—The Frame Cut Away, Showing the Inner Workings of Premium Wringer.

It comprises 83 pages, but is printed in miniature, so that it can almost be termed a vest pocket edition.

The latest rumors concerning the Minneapolis building came from the other side of the Atlantic. According to a report published in the English papers the Belgians did not get the order, but it was secured by Rothe Erde, Germany.

Among interesting railroad publications recently received by our Chicago office is a copy of the "Through Freight Tariff of

It is reported that the old Ducktown copper mines in Tennessee have been sold to an English syndicate.

Payson's Pendulum Parlor Door Hanger.

The Payson Mfg. Company, 1319 to 1325 West Jackson street, Chicago, Ill., are introducing a pendulum door hanger, as illustrated in Figs. 1 and 2. This is a trackless door hanger, the top part or plate being simply screwed to the boxing or other cross boards above the door; the adjusting bolt and nut are then put in the door and this completes the hanging.

As a preventive, roofing felt or similar material may be placed between the zinc and brickwork.

NEW PUBLICATIONS.

THE METALLURGY OF STEEL. Volume I. By Henry Marion Howe. Published by the Scientific Publishing Company, New York.

Probably the most ambitious work of the kind, and in some respects by far the

needed. Possibly this may be reserved for future volumes.

In his treatment of purely theoretical questions—in the sifting, collecting and tabulating of data bearing upon them—Mr. Howe has excelled anything which has yet been done in this direction. With the exception possibly of some of the German literature, which appears to have come to him at second hand, the author has made the most exhaustive study of what has been published. He has digested it so thoroughly that in the future our busy steel makers may well save themselves the time of going over the same ground and rely upon his work for the facts and for their relative significance. This in itself is a very great achievement. Thus his chapters on the relations between chemical composition and physical properties are complete and admirable. His review of the brilliant and heated discussion on the causes of blow holes is the clearest summary yet printed of one of the most interesting contests. We may cite also the chapters on cold working, to which, curiously enough, a chapter on wire drawing, cold rolling and cold drawing has been attached; those on the effect of work and welding, which, however, would seem to be more in place before the treatment on the rolling mill and the forge, than before the description of steel manufactures proper.

Mr. Howe goes very largely into the direct processes, which he credits with greater chances for the future than the majority of iron makers will be willing to admit. His description and discussion of the crucible steel manufacture is excellent, and the same is true of the Bessemer steel making, which is accompanied by a number of very good drawings. We have been very much astonished, however, at the absence of any discussion of the chemical phenomena. Possibly this is also re-

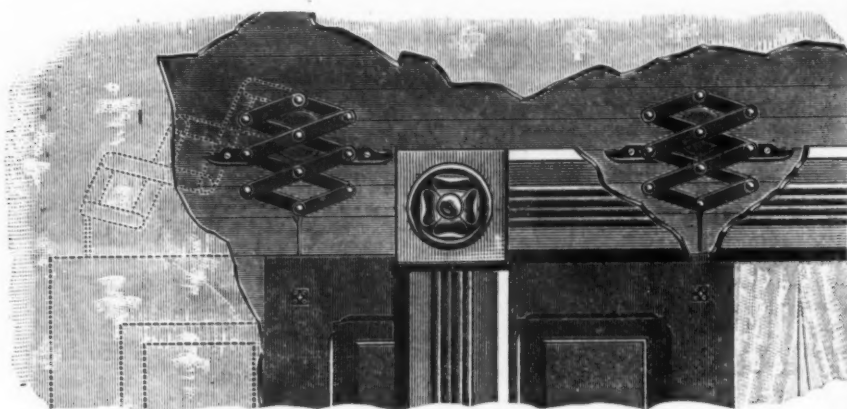


Fig. 1.—Payson's Pendulum Parlor Door Hanger.

The wheel is intended to roll on the short plate at the top, as the hanger truss swings from side to side in the various positions shown in the cuts, and is referred to as always keeping perfectly level. Some of the advantages alluded to in this hanger are the absence of the troubles which occur with the use of tracks, obviating the necessity of carrying wooden tracks in stock and the simplicity of applying. The hangers go on before plastering or can

best, is "Howe's Metallurgy of Steel," the first part of which was issued some time since. While Mr. Howe has not for many years been directly connected in a practical way with any of our large steel works, he has had the co-operation in his labors of our leading metallurgists and steel makers. Mr. Howe proves himself to be a student indefatigable and critical. His treatise rises far above the compilation from technical literature which the pub-

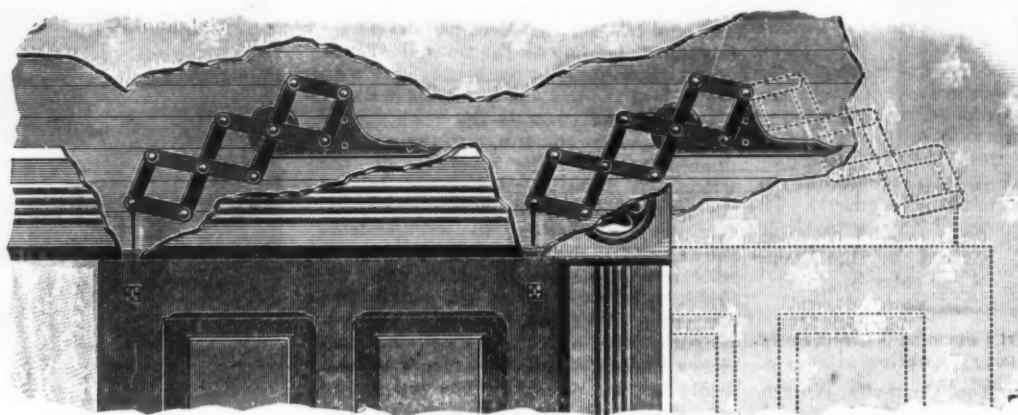


Fig. 2.—Payson's Pendulum Parlor Door Hanger.

be put on after the plastering is done, full directions accompanying each set.

The fact is mentioned in a German newspaper that under some conditions sheet zinc, when in direct contact with brickwork, suffers to an appreciable extent from rapid corrosion. It appears from this account that in building the Berlin city market halls a portion of the zincwork which rested upon brick walls was found to be deeply pitted at a number of places, this being particularly the case where the metal was close to the bricks. Chemical examination of these resulted in showing that they contained as high as 1.14 per cent. of soluble salts, capable of producing the destructive effect in question, and stimulated to more energetic action by moisture. The proportion of such salts, of course, varies with different kinds of bricks, while in some there may be nothing to induce any such corrosion.

lished lectures of a college professor is apt to be. Mr. Howe's work is not yet the one which we hope ultimately to possess in the record of the experience of one who has spent his life in the mill, one who has had constantly before him the aim either to reduce the figures in the cost sheet, or gain a reputation for quality of product. Mr. Howe has departed in at least one important particular from the methods of the text books with which metallurgists are so familiar, and with which they are so much disappointed. In his description of the Bessemer process he deals with the questions of handling materials and product as the leading element in general design of plant. He has followed the lines which Holley first laid down in his admirable series on American steel works. But Mr. Howe does not, at least not in this first volume, deal with costs in the manner which he promises in his preface, of giving quantities of material and of labor

served for the second volume, as may be the manufacture of open hearth steel, which is not touched upon at all. Yet Mr. Howe prints an appendix on special steels, including manganese, chrome and nickel steel; another on anti rust coatings and a third on the Chatillon et Commeny lead quenching.

Mr. Howe's work is not what a beginner requires, nor does it profess to be, but it is the best critical summary of an enormous mass of literature, enriched with many data privately gathered. It is illustrated by a large number of very good drawings. Typographically the book is very poor, indeed. We do not remember ever having read a work bristling with so many battered and imperfect letters.

The Wallis Iron Company, of New Jersey, have the contract for the iron work on the new stone bridge in Prospect Park—amount, \$15,542.

Shall We Bake and Cook by Electricity?

It is generally conceded on all sides, says *The Metal Worker*, that electricity is at present only in its infancy, and that the not very distant future is likely to witness developments concerning it which will prove as remarkably surprising as any of those with which the world is now familiar. The variety of uses to which the electric current may be put are manifold, and through the untiring energy of the inventive mind the number is constantly increasing. To enumerate them would be a difficult task, but it may be stated in very general terms that the use of electricity is found in almost every branch of industry, and that for domestic purposes its possibilities are being carefully considered. Those in the stove trade who have been alert to what was going on in the world of interest to them cannot have failed to notice a succession of patents which have lately been issuing from the United States Patent Office to Col. J. A. Price, of the Scranton Stove Works, Scranton, Pa., involving a radical modification of the system of ventilation now so extensively adapted to stove construction. By degrees the development has become more and more pronounced, until, in the issue of the *Patent Office Gazette* bearing date of July 29, the inventor broadly hints at electrical expression in his handling of the air currents in the oven. The approach to this result is gradual, and is characterized by considerable caution in the following quotation: "The currents of air so produced also seem to exert an electrical effect in the oven, which I attribute to the movement and heated application to the oven, as there is an intensity of action not otherwise accounted for."

From this it is not surprising that many in the trade are curious regarding the investigation of Colonel Price, who is certainly no novice in the art of stove construction, and who, besides, has been a liberal patron of the Patent Office at Washington. Every one knows that science and the mechanic arts are on the tiptoe of expectation in regard to the ability to excite the electric current without the aid of the dynamo and initial power, or in other words, directly from heat or some kindred element. The expressions employed by Mr. Price in his patent specification would seem to indicate that he is on the track of something having a wider significance than the mere preparation of food, and it is perhaps fair to assume that it can be no other than that concerning which expectation is aroused. It may be assumed that eventually electricity will be evolved directly from heat, and it may come by way of suggestion and perhaps accomplishment from the kitchen stove or elsewhere. All will certainly hope for success to one of the craft, and will wait with no little curiosity for the issue of Colonel Price's bold push into the present comparative obscurity and confusion.

In regard to the oven the system inaugurated appears to be one of a lower temperature than is generally necessary to do effective work, or lower than has ordinarily been considered safe. The claims are that even with this condition established more rapid service can be attained, while the loss through destructive distillation is greatly reduced. The inventor says: "The products may be said to be oxygenated instead of carbonized . . . and thus become a useful factor, combining, so to speak, a chemical with the mechanical action of the air."

A general review of the work thus far accomplished would seem to give the impression that there is something more in oven ventilation than the mere piercing of the plates to allow a small quantity of air to pass in or out of the oven during the

operation of baking, and indicates a very great as well as revolutionary change in oven construction in the future. As Colonel Price is entirely able to speak for himself on these important changes, the stove manufacturers as well as the trade of the country would no doubt give due attention to whatever he may offer for public consideration.

Portland Cement for Anchoring Bolts.

A writer in the *Polytechnic*, of Troy, relates how, during a recent experience in constructing foundations for an elevated railway, solid rock was encountered so near the surface as to necessitate anchoring the foundation bolts in it. Some more durable and economic means of accomplishing this than by the use of sulphur or lead was desired, and Portland cement was suggested as being suitable.

A careful investigation failed to find any record showing the adhesive strength of cement in pounds per square inch when used this way, hence it was decided to make such experimental tests as would give reasonably positive information on this point. For this purpose 14 holes were drilled in a ledge of solid limestone, seven of them being 1½ inches in diameter, and seven of them being 1 inch in diameter, all being 3½ feet deep. Seven ¾-inch and seven 1-inch bolts were prepared with thread and nut on one end and plain at the other end, but ragged for a length of 3½ feet from the blank end.

Four were anchored with sulphur, four with lead, and six with cement mixed neat. Half of each were ¾ inch and half 1 inch bolts, and all of them were allowed to stand till the cement was two weeks old. At the expiration of this time a lever of sufficient power was rigged and all the bolts were pulled, with the following results:

Sulphur.—Three bolts out of four developed their full strength, 16,000 and 31,000 pounds. One 1-inch bolt failed by drawing out under 12,000 pounds.

Lead.—Three bolts out of four developed their full strength, as above; one 1-inch bolt pulled out under 13,000 pounds.

Cement.—Five of the bolts out of six broke without pulling out; one 1-inch bolt began to yield in the cement at 26,000 pounds, but sustained the load a few seconds before it broke.

While this experiment demonstrated the superiority of cement, both as to strength and ease of application, yet it did not give the strength per square inch of area. To determine this, four specimens of limestone were prepared, each 10 inches wide, 18 inches long and 12 inches thick, two of them having 1½-inch holes and two of them 2¼-inch holes drilled in them. Into the small holes 1-inch bolts were cemented, one of them being perfectly plain round iron and the other having a thread cut on the portion which was embedded in the cement. Into the 2¼-inch holes were cemented 2-inch bolts similarly treated, and the four specimens were allowed to stand 13 days before completing the experiment. At the end of this time they were put into a standard testing machine and pulled. The plain 1-inch bolt began to yield at 20,000 pounds and the threaded one at 21,000 pounds. The 2-inch plain bolt began to yield at 34,000 pounds and the threaded one at 32,000 pounds, the strain in all cases being very slowly applied. The pump was then run at a greater speed, and the stones holding the 2 inch bolts split at 67 pounds in the case of the smooth one and at 50,000 pounds in the case of the threaded one.

It is thus seen that cement is more reliable, stronger and easier of application than either lead or sulphur, and that its resistance is from 400 to 500 pounds per square inch of surface exposed. It is also a well ascertained fact that it preserves

iron rather than corrodes it. The cement used throughout the experiment was an English Portland cement.

PERSONALS.

A. J. Moxham and E. J. Shriver are delegates to the Single Tax Convention being held in New York.

E. M. Brity, of the Columbia Iron and Steel Works, Columbia, Pa., has returned from Europe.

William A. H. Allen, Passed Assistant Engineer, U. S. N., has been chosen superintendent of the trade school of the Master Builders' Exchange in Philadelphia.

It is denied that the German manufacturers are preparing to emigrate to the United States in prospect of increased duties on American imports.

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CURRENT HARDWARE PRICES.

SEPTEMBER 3, 1890.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers' prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers' name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers, at the figures named.

Adjusters, Blind.

Domestic..... \$ doz \$3.00, 33¢
Excelsior..... \$ doz \$10.00, 50¢
Washburn's Self-Locking..... 20¢

Ammunition.—

Caps, Percussion, 1000—
Hicks & Goldmark's and Union Metallic
Cartridge Co.
F. L. Waterproof, 1-10's..... 34¢
E. B. Trimmied Edge, 1-10's..... 40¢
E. B. Grnd. Edge, Cent. Fire, 1-10's..... 46¢

Musket Waterproof, 1-10's..... 50¢
G. D..... 28¢
S. B. Genuine Imported..... 45¢
Eley's E. B..... 54¢
Eley's D Waterproof, Central Fire..... 1.60

Cartridges—
Rim Fire Cartridges..... 50¢
Rim Fire Military..... 15¢
Cent. Fire, Pistol and Rifle..... 25¢
Cent. Fire, Military and Sporting..... 15¢

Blank Cartridges, except 22 and 32 cal.,
additional 10% on above discounts.
Blank Cartridges, 22 cal., \$1.75..... 2¢
Blank Cartridges, 32 cal., \$3.50..... 2¢
Primed Shells and Bullets..... 15¢
B. B. Caps, Round Ball, \$1.75..... 2¢
B. B. Caps, Con. Ball, Swgd., \$2.00..... 2¢

Primers—
Berdan Primers, \$1.00..... 2¢
B. L. Caps (for Sturtevant Shells) \$1.00..... 2¢
All other Primers, \$1.20..... 2¢

Shells—
First quality 4, 8, 10 and 12 gauge..... 25¢
First quality, 14, 16 and 20 gauge (\$10
list)..... 30¢
Prize..... 40¢
Star, Club, Rival and Climax brands..... 33¢
Selbold's Comb. Shot Shells..... 15¢
Braas Shot Shells, list quality..... 60¢
Braas Shot Shells, Club, Rival, Climax..... 65¢

Shells Loaded—
Standard List, July 19, 1890..... 40¢
Wads—Price per M.
U. M. C. & W. R. A.—B. E., 11 up..... 65¢
U. M. C. & W. R. A.—B. E., 9 & 10..... 82¢
U. M. C. & W. R. A.—B. E., 8..... 96¢
U. M. C. & W. R. A.—B. E., 7..... 1.10
U. M. C. & W. R. A.—P. E., 11 up..... 1.15
U. M. C. & W. R. A.—P. E., 9 & 10..... 1.50
U. M. C. & W. R. A.—P. E., 8..... 1.70
U. M. C. & W. R. A.—P. E., 7..... 1.80
Eley's B. E., 11 up..... 1.75
Eley's P. E., 11 up..... 2.80

Anvils—
Eagle Anvils, \$10..... 15¢
Peter Wright's..... 10¢
Armstrong's Mouse Hole..... 9¢
Armitage's Mouse Hole, Extra..... 11¢
Trenton..... 9¢
Wilkinson's..... 9¢
J. & Riley Carr, Pat. Solid..... 11¢
Moore & Barnes Mfg. Co..... 33¢

Anvil Vise and Drill—
Millers Falls Co., \$18.00..... 20¢
Cheney Anvil and Vise..... 25¢
Allen Anvil and Vise, \$3.00..... 40¢
Star..... 45¢

Apple Parers—See Parers, Apple,
Ac.

Augers and Bits—
Douglas Mfg. Co..... 70¢
Wm. A. Ives & Co..... 70¢
Humphreysville Mfg. Co..... 70¢
French, Swift & Co. (F. H. Beecher,
P. S. & W. Co.)..... 70¢
Rockford Bit Company..... 55¢
Cook's, Douglas Mfg. Co..... 55¢
Cook's, N. H. Copper Co. 50¢
Ives' Circular Lip..... 30¢
Patent Solid Head..... 30¢
C. E. Jennings & Co., No. 10, extension
lip..... 40¢
C. E. Jennings & Co., No. 30..... 60¢
C. E. Jennings & Co., Auger Bits, 3/4 set,
32¢ quarters, No. 5, 85; No. 30, 35¢
Lewis' Patent Single Twist..... 45¢
Russell Jennings' Augers and Bits..... 45¢
Imitation Jennings' Bits..... 60¢
Snell's Jennings Pattern..... 60¢
Pugh's Black..... 20¢
Rockford, Jennings' Pattern..... 60¢
Car Bits, P. S. & W. Co..... 60¢
Snell's Car Bits..... 60¢
L. Hommedieu Car Bits..... 15¢
Forstner's Pat. Auger Bits..... 10¢
Cincinnati Bell-Hangers' Bits..... 30¢

Bit Stock Drills—
Morse Twist Drills..... 50¢
Standard..... 50¢
Cleveland..... 50¢
Syracuse, for metal..... 50¢
Syracuse, for wood (wood list) 30¢
Williams' or Holt's, for metal 50¢
Williams' or Holt's, for wood..... 40¢
Cincinnati, for wood..... 30¢
Cincinnati, for metal..... 45¢

Expansive Bits—
Clarke's small, 1/8; large, 3/8..... 35¢
Ives' No. 4, \$ doz \$60..... 40¢
Swan's..... 40¢
teer's, No. 1, \$26; No. 2, \$22..... 35¢
earn's No. 8, \$45..... 20¢

Gimlet Bits—
Common..... \$ doz \$2.75 to \$3.25
Diamond..... \$ doz \$1.10..... 25¢
Bee..... 25¢
Double Cut Sheardox's..... 45¢

Double Cut, Ct. Valley Mfg. Co..... 30¢
Double Cut, Hartwell's, \$ gro..... 35¢
Double Cut, Douglas's..... 40¢
Double Cut, Ives..... 60¢

Hollow Augers—
Ives..... 33¢
French, Swift & Co..... 33¢
Douglas's..... 33¢
Bonney's Adjustable, \$ doz \$48..... 40¢
Stearns..... 40¢
Ives' Expansive, each \$4.50..... 50¢
Universal Expansive, each \$4.50..... 50¢
Wood's..... 25¢
Cincinnati Adjustable..... 25¢
Cincinnati Standard..... 25¢

Ship Augers and Bits—
L'Hommedieu's..... 15¢
Watrous..... 15¢
Snell's..... 15¢
Snell's Ship Auger Pat'n Car Bits..... 15¢

Awl Hfts—See Hfts, Awl.

Awls, Brad Sets, &c—
Awls, Sewing, Common \$ gr \$1.70, 35¢
Awls, Should. Peg, \$ gr \$2.45, 40¢
Awls, Pat. Peg, \$ gr \$3.60, 40¢
Awls, Shouldered Brad, \$ gr \$2.70, 35¢
Awls, Handled Brad, \$ gr \$7.50, 45¢
Awls, Handled Scratch \$ gr \$7.50, 45¢
Awls, Socket Scratch, \$ doz \$1.50, 25¢

Awl and Tool Sets—See Sets, Awl
and Tool.

Axes—
First quality..... \$2.00, \$3.50
Others..... 75¢
Note.—Jobbers often sell at lower
prices than the above.

Axle Grease—See Grease, Axle.

Axles—
No. 1, 4¢; No. 2, 5¢; No. 3, 6¢; No. 4, 7¢; No. 5, 8¢; No. 6, 9¢; No. 7, 10¢; No. 8, 11¢; No. 9, 12¢; No. 10, 13¢; No. 11, 14¢; No. 12, 15¢; No. 13, 16¢; No. 14, 17¢; No. 15, 18¢; No. 16, 19¢; No. 17, 20¢; No. 18, 21¢; No. 19, 22¢; No. 20, 23¢; No. 21, 24¢; No. 22, 25¢; No. 23, 26¢; No. 24, 27¢; No. 25, 28¢; No. 26, 29¢; No. 27, 30¢; No. 28, 31¢; No. 29, 32¢; No. 30, 33¢; No. 31, 34¢; No. 32, 35¢; No. 33, 36¢; No. 34, 37¢; No. 35, 38¢; No. 36, 39¢; No. 37, 40¢; No. 38, 41¢; No. 39, 42¢; No. 40, 43¢; No. 41, 44¢; No. 42, 45¢; No. 43, 46¢; No. 44, 47¢; No. 45, 48¢; No. 46, 49¢; No. 47, 50¢; No. 48, 51¢; No. 49, 52¢; No. 50, 53¢; No. 51, 54¢; No. 52, 55¢; No. 53, 56¢; No. 54, 57¢; No. 55, 58¢; No. 56, 59¢; No. 57, 60¢; No. 58, 61¢; No. 59, 62¢; No. 60, 63¢; No. 61, 64¢; No. 62, 65¢; No. 63, 66¢; No. 64, 67¢; No. 65, 68¢; No. 66, 69¢; No. 67, 70¢; No. 68, 71¢; No. 69, 72¢; No. 70, 73¢; No. 71, 74¢; No. 72, 75¢; No. 73, 76¢; No. 74, 77¢; No. 75, 78¢; No. 76, 79¢; No. 77, 80¢; No. 78, 81¢; No. 79, 82¢; No. 80, 83¢; No. 81, 84¢; No. 82, 85¢; No. 83, 86¢; No. 84, 87¢; No. 85, 88¢; No. 86, 89¢; No. 87, 90¢; No. 88, 91¢; No. 89, 92¢; No. 90, 93¢; No. 91, 94¢; No. 92, 95¢; No. 93, 96¢; No. 94, 97¢; No. 95, 98¢; No. 96, 99¢; No. 97, 1.00; No. 98, 1.01; No. 99, 1.02; No. 100, 1.03; No. 101, 1.04; No. 102, 1.05; No. 103, 1.06; No. 104, 1.07; No. 105, 1.08; No. 106, 1.09; No. 107, 1.10; No. 108, 1.11; No. 109, 1.12; No. 110, 1.13; No. 111, 1.14; No. 112, 1.15; No. 113, 1.16; No. 114, 1.17; No. 115, 1.18; No. 116, 1.19; No. 117, 1.20; No. 118, 1.21; No. 119, 1.22; No. 120, 1.23; No. 121, 1.24; No. 122, 1.25; No. 123, 1.26; No. 124, 1.27; No. 125, 1.28; No. 126, 1.29; No. 127, 1.30; No. 128, 1.31; No. 129, 1.32; No. 130, 1.33; No. 131, 1.34; No. 132, 1.35; No. 133, 1.36; No. 134, 1.37; No. 135, 1.38; No. 136, 1.39; No. 137, 1.40; No. 138, 1.41; No. 139, 1.42; No. 140, 1.43; No. 141, 1.44; No. 142, 1.45; No. 143, 1.46; No. 144, 1.47; No. 145, 1.48; No. 146, 1.49; No. 147, 1.50; No. 148, 1.51; No. 149, 1.52; No. 150, 1.53; No. 151, 1.54; No. 152, 1.55; No. 153, 1.56; No. 154, 1.57; No. 155, 1.58; No. 156, 1.59; No. 157, 1.60; No. 158, 1.61; No. 159, 1.62; No. 160, 1.63; No. 161, 1.64; No. 162, 1.65; No. 163, 1.66; No. 164, 1.67; No. 165, 1.68; No. 166, 1.69; No. 167, 1.70; No. 168, 1.71; No. 169, 1.72; No. 170, 1.73; No. 171, 1.74; No. 172, 1.75; No. 173, 1.76; No. 174, 1.77; No. 175, 1.78; No. 176, 1.79; No. 177, 1.80; No. 178, 1.81; No. 179, 1.82; No. 180, 1.83; No. 181, 1.84; No. 182, 1.85; No. 183, 1.86; No. 184, 1.87; No. 185, 1.88; No. 186, 1.89; No. 187, 1.90; No. 188, 1.91; No. 189, 1.92; No. 190, 1.93; No. 191, 1.94; No. 192, 1.95; No. 193, 1.96; No. 194, 1.97; No. 195, 1.98; No. 196, 1.99; No. 197, 2.00; No. 198, 2.01; No. 199, 2.02; No. 200, 2.03; No. 201, 2.04; No. 202, 2.05; No. 203, 2.06; No. 204, 2.07; No. 205, 2.08; No. 206, 2.09; No. 207, 2.10; No. 208, 2.11; No. 209, 2.12; No. 210, 2.13; No. 211, 2.14; No. 212, 2.15; No. 213, 2.16; No. 214, 2.17; No. 215, 2.18; No. 216, 2.19; 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No. 686, 6.89; No. 687, 6.90; No. 688, 6.91; No. 689, 6.92; No. 690, 6.93;

Chucks—

Beach Pat.	each, \$5.00	20%
Horse's Adjustable, each, \$7.00, 20@20%		
Danbury, each, \$6.00, 80@20%		
Syracuse, Bala Pat.		
Syracuse's Patent Chucks, 30%		
Combination Lathe Chucks, 40%		
Universal Lathe Chucks, 40%		
Independent Lathe Chucks, 40%		
Drill Chucks, 15%		
Union Mfg. Co., \$5.50, 25%		
Victor, 40%		
Combination, 40%		
Universal, 40%		
Independent, 40%		

Churns.

Timin Union No. 1, 5 gallon, \$3.25 each	
Timin Union No. 2, 7 gallon, \$3.75 each	
Timin Union No. 3, 10 gallon, \$4.25 each	

Clamps—

R. I. Tool Co.'s Wrought Iron, 25%	
Adjustable, Cincinnati, 15%	
Adjustable, Hammers, 15%	
Adjustable, Stearn's, 30@30%	
Stearns' Adjustable Cabinet and Cor. ner, 30@30%	
Cabinet, Sargent's, 70@10%	
Carriage Makers', Sargent's, 70@10%	
Carriage Makers', P. S. & W. Co., 40@10%	
Eberhard Mfg. Co., 40@10%	
Warner's, 40@10%	
Saw Clamps, see Vices, Saw Filers', 40%	
Carpenters', Cincinnati, 25@10%	

Cleavers.

Butchers', 25@30%	
Bradley's, 30@50%	
L. J. White, 30@50%	
Beatty's, 40@40%	
New Haven Edge Tool Co., 40%	
P. S. & W., 30@50%	
Poster Bros., 30%	
Schulte, Lohoff & Co., 40@40%	

Clips—

Norway Axle, 1/4 & 5-16, 55@55%	
2nd grade Norway Axle, 1/4 & 5-16, 65@55%	
Superior Axle Clips, 65@55%	
Norway Spring Bar Clips, 5-16, 60@55%	
Wrought Iron Felloe Clips, 5-16, 55%	
Steel Felloe Clips, 5-16, 55%	
Baker Axle Clips, 55%	

Cloth and Netting, Wire—See Wire, &c.

Cockeyes, 60%

Cocks, Brass, 50@25%

Coffee Mills—See Mills, Coffee.

Collars, Dog, &c.

Medford Fancy Goods Co., 40@10%	
Embossed, Gift, Pope & Steven's list, 30@10%	
Leather, Pope & Steven's list, 40%	
Brass, Pope & Steven's list, 40%	
Chapman Mfg. Company, 50@10@50%	

Combs, Curry.

Fitch's, 50@10@50@10@10%	
Rubber, per doz \$10.00, 20%	
Perfect, 50%	

Compasses, Dividers, &c.—

Compasses, Calipers, Dividers, 70@70@10%	
Bemis & Call Co.'s, 60@5%	
Dividers, 60@5%	
Compasses & Calipers, 50@5%	
Wing and Inside or Outside, 50@5%	
Double, 60%	
(Call's Pat. Inside), 30%	
Excelsior, 50%	
J. Stevens & Co.'s, 25@10%	
Starrett's, 25%	
Spring Calipers and Dividers, 25%	
Lock Calipers and Dividers, 25%	
Combination Dividers, 25%	

Coopers' Tools—See Tools, Coopers'.

Cord, Sash—

Common, 10@11%	
Patent, good quality, 13@13%	
White Cotton Braided, fair, 28@20%	
Common Russia Sash, 13@13%	
Patent, 15@15%	
Cable Laid Italian Sash, 22@23%	
Indian Cable Laid, 13@13%	
Silver Lake—	
A Quality, White, 50%, 10@10@5%	
A Quality, Drab, 55%, 10@10@5%	
B Quality, White, 50%, 28@30%	
B Quality, Drab, 55%, 31@33%	
C Quality, White only, 26@28%	
Sylvan Spring, Extra Braided, White, 34%	
Sylvan Spring, Extra Braided, Drab, 30%	
Semper Idem, Braided, White, 30%	
Egyptian, India Hemp, Braided, 25%	
Ramson—	
Braided, White Cotton, 50%, 30@30@5%	
Braided, Drab Cotton, 55%, 30@30@5%	
Braided, Italian Hemp, 55%, 30@30@5%	
Braided, Linen, 80%, 30@30@5%	

Corkscrews—See Screws, Cork.

Corn Knives and Cutters—See Knives, Corn.

Crackers, Nut—

Table (H. & B. Mfg. Co.), 40%	
Blake's Pattern, 40%	
Turner & Seymour Mfg. Co., 50%	

Cradles—

Grain, 50@55@2@30@10@2%	
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Crays.

White Crays, 12@12@12%	
D. M. Stewart Mfg. Co., Metal Work- ers, 25%	
M. Stewart Mfg. Co., Rolling Mill, 25%	
See also Chalk, 25%	

Crow Bars—See Bars, Crow.

Curry Combs—See Combs, Curry.

Curtain Pins—See Pins, Curtain.

Cutters—

Meat.

Dixon's 2 doz, 40@5%	
Nos., 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72 74 76 78 80 82 84 86 88 90 92 94 96 98 100	

Woodruff's 2 doz, 40@5%	
Nos., 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72 74 76 78 80 82 84 86 88 90 92 94 96 98 100	

Hales Pattern 2 doz, 15.00 18.00	
Nos., 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100	

American, 2 doz, 27.00 33.00 45.00	
Nos., 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100	

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Nos., 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72 74 76 78 80 82 84 86 88 90 92 94 96 98 100	

Great American Meat Cutter, 2 doz, 3 3.50 4 4.50 5 5.50 6 6.50 7 7.50 8 8.50 9 9.50 10 10.50 11 11.50 12 12.50 13 13.50 14 14.50 15 15.50 16 16.50 17 17.50 18 18.50 19 19.50 20 20.50 21 21.50 22 22.50 23 23.50 24 24.50 25 25.50 26 26.50 27 27.50 28 28.50 29 29.50 30 30.50 31 31.50 32 32.50 33 33.50 34 34.50 35 35.50 36 36.50 37 37.50 38 38.50 39 39.50 40 40.50 41 41.50 42 42.50 43 43.50 44 44.50 45 45.50 46 46.50 47 47.50 48 48.50 49 49.50 50 50.50 51 51.50 52 52.50 53 53.50 54 54.50 55 55.50 56 56.50 57 57.50 58 58.50 59 59.50 60 60.50 61 61.50 62 62.50 63 63.50 64 64.50 65 65.50 66 66.50 67 67.50 68 68.50 69 69.50 70 70.50 71 71.50 72 72.50 73 73.50 74 74.50 75 75.50 76 76.50 77 77.50 78 78.50 79 79.50 80 80.50 81 81.50 82 82.50 83 83.50 84 84.50 85 85.50 86 86.50 87 87.50 88 88.50 89 89.50 90 90.50 91 91.50 92 92.50 93 93.50 94 94.50 95 95.50 96 96.50 97 97.50 98 98.50 99 99.50 100 100.50	
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Each, \$2.00 \$2.75 \$3.00 \$3.50 \$4.00 \$4.50 \$5.00 \$5.50 \$6.00 \$6.50 \$7.00 \$7.50 \$8.00 \$8.50 \$9.00 \$9.50 \$10.00 \$10.50 \$11.00 \$11.50 \$12.00 \$12.50 \$13.00 \$13.50 \$14.00 \$14.50 \$15.00 \$15.50 \$16.00 \$16.50 \$17.00 \$17.50 \$18.00 \$18.50 \$19.00 \$19.50 \$20.00 \$20.50 \$21.00 \$21.50 \$22.00 \$22.50 \$23.00 \$23.50 \$24.00 \$24.50 \$25.00 \$25.50 \$26.00 \$26.50 \$27.00 \$27.50 \$28.00 \$28.50 \$29.00 \$29.50 \$30.00 \$30.50 \$31.00 \$31.50 \$32.00 \$32.50 \$33.00 \$33.50 \$34.00 \$34.50 \$35.00 \$35.50 \$36.00 \$36.50 \$37.00 \$37.50 \$38.00 \$38.50 \$39.00 \$39.50 \$40.00 \$40.50 \$41.00 \$41.50 \$42.00 \$42.50 \$43.00 \$43.50 \$44.00 \$44.50 \$45.00 \$45.50 \$46.00 \$46.50 \$47.00 \$47.50 \$48.00 \$48.50 \$49.00 \$49.50 \$50.00 \$50.50 \$51.00 \$51.50 \$52.00 \$52.50 \$53.00 \$53.50 \$54.00 \$54.50 \$55.00 \$55.50 \$56.00 \$56.50 \$57.00 \$57.50 \$58.00 \$58.50 \$59.00 \$59.50 \$60.00 \$60.50 \$61.00 \$61.50 \$62.00 \$62.50 \$63.00 \$63.50 \$64.00 \$64.50 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Shepard Hand Fluter, No. 110 # dos \$11.00.....40%
 Shepard Hand Fluter, No. 95 # dos \$8.00.....40%
 Clark's Hand Fluter # dos \$15.00.....35%
 Combined Fluter and Sad Iron, # dos \$15.00.....30%
 Buffalo # dos \$10.00.....10%

Holting—
 Moore's Hand Holst, with Lock Brake.....30%
 Moore's Differential Pulley Block.....40%
 Energy Mfg. Co.'s.....35%

Mallets.
 Hickory.....20¢10¢20¢10¢10¢
 Lignumvite.....20¢10¢20¢10¢10¢
 R. & L. Block Co., Hickory & L. V. # dos \$10.00.....30%
 Mattocks, Regular list.....60¢10¢

Measures—
 Standard Fiberware, No. 1, peck, # dozen, \$4; 1/2 peck, \$3.50.
Meat Cutters—See Cutters, Meat.

Mills.
Coffee—
 Box and Slide, List Jan. 1, 1888.....60¢2¢
 American, Enterprise Mfg. Co. 20¢10¢30¢
 The Swift, Lane Bros.....20¢10¢

Mining Knives—See Knives, Mining.
Molasses Gates—See Gates, Molasses.

Money Drawers—See Drawers, Money.

Mowers, Lawn.
 Leading makers.....60¢60¢10¢5¢
 Other makers.....60¢10¢5¢60¢10¢10¢
 Pennsylvania.....60¢
 Continental.....60¢
 New Model.....60¢10¢5¢
 New Quaker City.....60¢10¢5¢
 Great American.....60¢10¢5¢

Muzzles—
 Safety.....# dos \$3.00, 25¢

Nails.
 Cut and Wire. See Trade Report.
 Wire Nails, Papered.....
 Association list, July 15, '90, 75¢75¢5¢
 Tack Mfrs.' list.....60¢10¢10¢
 Wire Nails, Standard Penny.....
 Card June 1, '90, base.....\$2.50 to \$2.60

Horse—
 Nos. 6 7 8 9 10
 Ausable.....25¢ 20¢ 25¢ 24¢ 23¢
 Clinton, Fin.....11¢
 Essex.....25¢ 20¢ 25¢ 24¢ 23¢
 Lyr.....25¢ 23¢ 22¢ 21¢ 20¢
 Snowden.....25¢ 23¢ 22¢ 21¢ 20¢
 Putnam.....25¢ 21¢ 20¢ 19¢ 18¢
 Vulcan.....23¢ 21¢ 20¢ 19¢ 18¢
 Northwest.....25¢ 23¢ 22¢ 21¢ 20¢
 Globe.....23¢ 21¢ 20¢ 19¢ 18¢
 Boston.....23¢ 21¢ 20¢ 19¢ 18¢
 A. C.....25¢ 23¢ 22¢ 21¢ 20¢
 C. B.-K.....25¢ 23¢ 22¢ 21¢ 20¢
 Champlain.....25¢ 23¢ 22¢ 21¢ 20¢
 New Haven.....25¢ 23¢ 22¢ 21¢ 20¢
 Saranac.....23¢ 21¢ 20¢ 19¢ 18¢
 Champion.....23¢ 21¢ 20¢ 19¢ 18¢
 Capewell.....25¢ 23¢ 22¢ 21¢ 20¢
 Star.....23¢ 21¢ 20¢ 19¢ 18¢
 Anchor.....23¢ 21¢ 20¢ 19¢ 18¢
 Western.....23¢ 21¢ 20¢ 19¢ 18¢
 Empire Bronzed.....14¢

Picture—
 Brass Head, Sargent's list.....50¢10¢10¢
 Brass Head, Combination list.....50¢10¢
 Porcelain Head, Sargent's list.....50¢10¢10¢
 Porcelain Head, Combination list.....40¢10¢
 Niles' Patent.....40%

Nail Pullers.—See Pullers, Nail.
Nail Sets.—See Sets, Nail.
Nut Crackers.—See Crackers, Nut.

Nuts—
 Nuts, off list Dec. 18, 1889: Square. Hex. Hot Pressed.....5.45¢ 8.00¢
 Cold Punched.....5.00¢ 4.90¢
 In lots less than 100 #, # dos, add 1¢; 1-b boxes, add 1¢ to list.

Oakum—
 Government.....# 7¢7¼¢
 U. S. Navy.....# 6¢8¼¢
 Navy.....# 6¼¢5¼¢

Oilers—
 Zinc and Tin.....65¢65¢10¢
 Brass and Copper.....50¢10¢50¢10¢5¢
 Malleable, Hammers' Improved, No. 1, \$3.60; No. 2, \$4.00; No. 3, \$4.40 # dos.....10¢10¢5¢
 Malleable, Hammers, Old Pattern, same list.....40%
 Prior's Pat. or "Paragon" Zinc.....60¢10¢10¢
 Prior's Pat. or "Paragon" Brass.....50¢
 Olmstead's Tin and Zinc.....60¢
 Olmstead's Brass and Copper.....60¢
 Olmstead's Zinc.....60¢
 Broughton's Brass.....60¢
 Gen. P. D. & Co.....# gro. 82¢
 Steel, Draper and Williams.....50%

Openers, Can.
 Messenger's Comet.....# dos \$3.00, 25¢
 American.....# gross \$3.00
 Duplex.....# dos 25¢ 15¢20¢
 Lyman's.....# dos \$3.75, 20¢
 No. 4 French.....# dos \$2.25, 50¢60¢
 No. 5, Iron Handle.....# gr \$6.00, 45¢50¢
 Eureka.....# dos \$2.50, 10¢
 Sardine Sissors.....# dos \$2.75, 3.00¢
 Star.....# dos 3.00, 2.75¢
 Sprague, No. 1, \$2.00 No. 2, \$1.50.....50¢10¢10¢
 Excelstor, No. 1, \$2.50 No. 2, \$1.50.....40%

World's Best, # gross, No. 1, \$12.00 No. 2, \$24.00; No. 3, \$36.00.....50¢10¢
 Universal, # dos \$3.00.....35¢5¢
 Domestic, # dos \$2.50.....45¢
 Champion # dos \$2.00.....45¢

Packing, Steam—
Rubber—
 Standard.....60¢5¢65¢
 Extra.....40¢50¢55¢
 N. Y. B. & P. Co., Standard.....40¢10¢50¢
 N. Y. B. & P. Co., Empire.....60¢5¢65¢
 N. Y. B. & P. Co., Salamander.....# 55¢, 10¢15¢
 # 55¢, 25¢25¢55¢

Jenkins' Standard, # 50¢, # 25¢25¢55¢

Miscellaneous—
 American Packing.....10¢11¢
 Russia Packing.....14¢
 Italian Packing.....13¢14¢
 Cotton Packing.....15¢17¢
 Jute.....7¢8¢

Padlocks—See Locks.
Pails.
Galvanized Iron—
 Quarts 10 12 14
 Hill's Light Weight, # dos. \$2.75 3.00 3.25
 Hill's Heavy Weight, # da. 3.00 3.25 3.75
 Sidney Shepard & Co.....2.35 2.85 3.05
 Iron Clad.....2.50 2.75 3.00
 Fire Buckets.....2.75 3.25 3.50
 Buckets, see Well Buckets.

Indurated Fibre Ware—25¢
 Star Pails, 12 qt., per doz. \$4.00
 Fire, Stable and Milk, 14 qt. # dos \$7.50
Standard Fibre Ware—
 Plain. Dec'd
 Water Pails, 12 qt., per doz. \$4.00
 Dairy Pails, 14 qt., per doz. 4.50
 Fire Pails, No. 1, 12 qt., per doz. 4.50
 Fire Pails, No. 2, 14 qt., per doz. 5.00
 Sugar Pails.....6.00 6.50
 Buggy Pails.....6.00
 Slop Jars (bat trap).....9.00 9.00
 Chamber Pails, 14-qt.....6.50 7.50

Pans.
Dripping.
 Small sizes.....# 6¼¢
 Large sizes.....# 5¼¢
Fry—
 Standard List:
 No. 1 2 3 4
 # dos \$3.00 \$3.75 \$4.25 \$4.75 \$5.25
 No.....5 6 7 8
 # dos \$6.00 \$7.00 \$8.00 \$9.00
 Polished, regular goods.....70¢10¢
 Acme Fry Pans.....60¢10%

Paper and Cloth—
Sand and Emery—
 List April 19, 1888.....50¢50¢10¢
 Sibley's Emery and Crocus Cloth.....30%

Parers.
Apple.
 Advance.....# dos \$4.75
 Baldwin.....# dos 5.25
 Bonanza.....each 5.00
 Champion.....# dos 7.25
 Perfect.....# dos 4.00
 Dandy.....each 7.50
 Eureka, 1888.....each 16.00
 Family Bay State.....# dos 12.00
 Favorite.....# dos 5.00
 Gem.....# dos 5.25
 Gold Medal.....# dos 4.00
 Ideal.....# dos 27.00 to \$30.00
 Little Star.....# dos 4.50
 Monarch.....# dos 13.50
 New Lightning.....# dos 5.50
 Oriole.....# dos 4.50
 Penn.....# dos 4.00
 Perfect.....# dos 4.00
 Pomona.....# dos 4.00
 Rocking Table.....# dos 6.00
 Turntable.....# dos 4.50
 Victor.....# dos 13.50
 Waverly.....# dos 4.00
 White Mountain.....# dos 4.00
 72.....# dos 4.25
 76.....# dos 5.75
 78.....# dos 6.50

Potato—
 White Mountain.....# dos \$4.50
 Antrim Combination.....# dos \$5.50
 Rooster.....# dos \$13.50
 Saratoga.....# dos \$5.50

Pencils—
 Faber's Carpenters'.....high list 50¢
 Faber's Round Gilt.....# gro \$5.25
 Dixon's Lead.....# gro \$4.50
 Dixon's Lumber.....# gro \$6.75
 Dixon's Carpenters'.....40¢10%

Picks—
 Railroad or Adse Eye, 5 to 6, \$12.00; 6 to 7, \$13.00.....60¢10%

Picture Nails.—See Nails, Picture.
Pinking Irons.—See Irons, Pinking.

Pins.
Bow—
 Humason, Beckley & Co.'s.....60¢10¢
 Sargent & Co.'s.....\$17 and \$18.....60¢10¢
 Peck, Stow & W. Co.....60¢10¢50¢10¢5¢
Curtain—
 Silvered Glass.....net
 White Enamel.....net
Escutcheon,
 Iron, list Nov. 11, 1885.....50¢10¢50¢10¢5¢
 Brass.....60¢80¢

Pipe, Wrought Iron—
 List September 18, 1889,
 1¼ and under, Plain.....47¼¢
 1¼ and under, Galvanized.....40%
 1¼ and over, Plain.....47¼¢
 1¼ and over, Galvanized.....47¼¢
 Boiler Tubes, Iron.
 1¼ and under.....45%
 2 to 4 inch.....50%
 4-inch and larger.....52¼¢

Planes and Plane Irons—
Wood Planes—
 Molding.....40¢2¢
 Bench, First Quality.....55¢2¢
 Bench, Second Quality.....60¢2¢
 Bailey's (Stanley R. & L. Co.).....40¢10%

Iron Planes—
 Bailey's (Stanley R. & L. Co.).....40¢10¢40¢10¢10%
 Miscellaneous Planes (Stanley R. & L. Co.).....20¢10¢20¢10¢10%
 Victor Planes (Stanley R. & L. Co.).....20¢10¢20¢10¢10%

Steer's Iron Planes.....35¢35¢10¢
Meriton Mail Iron Co.'s.....40¢40¢10¢
Davis's Iron Planes.....40¢40¢10¢
Birmingham Plane Co.....50¢50¢10¢
Gate Tool Co.'s Self-Setting.....20¢10¢10¢
Chaplin's Iron Planes.....40¢40¢10¢
Sargent's.....30¢10¢30¢10¢10¢
Standard Tool Co.....60¢50¢5¢

Plane Irons—
 Butcher's.....\$5.00 to \$5.25 to 2¢
 Buck Bros.....30%
 Auburn "Thule".....35¢2¢
 Ohio.....35¢2¢
 Sandusky.....25%
 S. & I. J. White.....25%

Plates.
 Fellow.....# 8¢6¼¢

Pliers and Nippers—
 Button's Patent.....50¢50¢10%
 Hall's No. 2, 5 in., \$13.50; No. 4, 7 in. \$21.00 # dos.....20¢10¢30¢45¢
 Humason & Beckley Mfg. Co.....50¢50¢10%
 Gas Pliers.....60%
 Gas Pliers, Custar's Nickel Plated.....60%
 Russell's Parallel.....40%
 P. S. & W. Cast Steel.....50%
 P. S. & W. Timmers' Cutting Nippers.....add 8¢ dis 10%
 Carew's Pat. Wire Cutters.....20%
 Morrill's Parallel, # dos \$12.00.....30¢5¢
 Cronk's 8 in., \$15.00; 10 in. \$21.00.....40¢40¢5¢

Plumbs and Levels—
 Regular List.....70¢10¢70¢10¢10%
 Diston's.....50%
 Pocket Levels.....70¢10¢70¢10¢10%
 Davis Iron Levels.....70%
 Davis' Inclinoimeters.....10¢10%

Poachers.
Egg.
 Buffalo Steam Egg Poachers, # dos. No. 1, \$6.00; No. 2, \$9.00.....25%

Pokes, Animal—
 Bishop's I. X. L.....# dos \$6.00
 Bishop's O. K.....# dos \$5.25
 Bishop's Pioneer.....# dos \$3.75
 Bishop's American.....# dos \$2.75
 Double Stale.....# dos \$5.75
 Eagle, Single Stale.....# dos \$3.75
 Buckeye, Single Stale.....# dos \$2.75

Police Goods.
 R. I. Tool Co., Handcuffs, \$15.00 # dos 10%
 R. I. Tool Co., Leg Irons, \$25.00 # dos 10%
 Tower's.....25%
 Francis's Improved Handcuffs: 2 Hands, Polished # dos \$48.00; Nickle-plated, \$57.00; 3 Hands, Polished, # dos \$72.00; Nickle-plated, \$84.00.....25%
 J. P. Lovell's Police Goods.....25%

Polish, Metal.
 Prestoline.....30%
 Prestoline Paste.....33¼¢
 Gaston's Silver Compound.....33¼¢

Polish, Stove.
 Joseph Dixon's.....# gro \$6.00, 10%
 Gem.....# gro \$4.50, 10%
 Gold Medal.....# gro \$6.00, 25%
 Mirror.....# gro \$6.00, 25%
 Lustro.....# gro \$4.75
 Ruby.....# gro \$3.75
 Rising Sun, 3 gro lots.....# gro \$5.50
 Dixon's Plumbago.....# 8¢
 Boynton's Noon Day, # gro.....13.00
 Parlor Pride Stove Enamel, # gro # cans Yates' Liquid.....# gal \$0.90, 80 70 60
 Yates Standard Paste Polish, 10-b cans.....# 15¢

Jet Black.....# gro \$3.50
Japanese.....# gro \$3.50
Finide.....# gro \$2.50
Diamond.....# gro \$10.00
Bonnell's Liquid Stove Polish.....# gro \$9.00
Bonnell's Paste Stove Polish.....# gro \$6.00
Black Eagle Benzine Paste, 5 and 10 n cans.....12¼¢
Black Jack Water Paste, 5 and 10 n cans.....12¼¢
Nickel Plate Paste.....# gro \$8.00

Poppers, Corn—
 Round or Square, 1 qt., # gr \$10.00 to 10.50
 Round or Square, 1½ qt., # gr \$15 to 15.50
 Round or Square, 2 qt., # gr \$18.50 to 19.00

Post Hole and Tree Augers and Diggers—See Diggers, Post Hole, &c.
Potato Parers—See Parers, Potato.

Pots.
Glue—
 Tinned.....40%
 Enamelled.....40%5¢
 Family, Howe's "Eureka".....40%
 Family, L. F. C.'s "Handy".....50%

Presses.
Fruit and Jelly—
 Enterprise Mfg. Co.....20¢10¢30¢
 Hens.....# dos \$3.50
 Shepard's Queen City.....40%

Pruning Hooks and Shears.—See Shears.
Pullers.
Nail.
 Curtiss Hammer.....# dos \$9.00
 Giant, No. 1.....# dos \$13.00, 10%
 Giant, No. 2.....# dos \$15.00, 10%
 Pelican.....# dos \$9.00, 25%

Pulleys—
 Hot House, Awning, &c.....60¢10%
 Japaned Screw.....60¢10%
 Brass Screw.....60¢10%
 Japaned Side.....60¢10%
 Japaned Clothes Line.....60¢10%
 Empire Sash Pulley.....55¢60%
 Moore's Sash, Anti-Friction.....50%
 Hay Fork, Solid Eye, \$4.00; Swivel \$4.50.....50¢10¢50¢10¢5¢
 Hay Fork, "Anti-Friction," 5 in. Solid.....50%
 Hay Fork.....50%
 Hay Fork "E" Common and Pat. Bushed.....20%
 Hay Fork, Tarbox Pat. Iron.....20%
 Hay Fork, Reed's Self-Lubricating.....60%
 Shade Rack.....45%
 Tackle Block.....See Blocks
 Moore's Anti-Friction 5 in. Wheel, # dos \$12.00.....40

Pumps—
 Clatren, Best Makers.....60¢60¢10%
 Pitcher Spout, Best Makers.....67¼¢70%
 Pitcher Spout, Cheaper Goods.....70¢70¢5¢

Punches—
 Saddlers' or Drive, good, # dos.....60¢65¢
 Bemis & Call Co.'s Cast Steel Drive, 50¢5¢
 Bemis & Call Co.'s Springhead Socket, 50¢5¢
 Spring, good quality.....# dos \$2.50 to \$2.60
 Spring, Leach's Pat.....15¢
 Bemis & Call Co.'s Spring and Check.....40%
 Solid Timmers' P.S. & W. Co., # dos \$1.44, 55¢
 Tin's Hollow Punches P.S. & W. Co. 20¢2¢
 Rice Hand Punches.....15¢
 Avery's Revolving.....40%
 Avery's Saw-Set and Punch. See Saw Sets.

Rail—
 Sliding Door, Wrt Brass, # 35¢.....15¢
 Sliding Door, Bronzed Wrt Iron, # ft. 7¢
 Sliding Door, Iron, Painted, # foot 4¢, 40¢
 Barn Door, Light In. # ¼ ¾
 Per 100 feet.....\$2.10 2.50 3.10, 10%
 B. D. for N. E. Hangers.....Small Med. Sigs.

Per 100 feet.....\$2.15 2.70 3.25, net
Terry's Steel Rail, # foot.....45¢
Victor Track Rail, 7¢ # foot.....50¢2¢
Carrier Steel Rail, # foot.....45¢
Moore's Wrought Iron.....25%

Rakes—
 Cast Steel, Association goods.....70%
 Cast Steel, outside goods.....60¢10¢10¢70¢5¢
 Malleable.....70¢70¢45¢
 Gibbs Lawn Rake.....\$12.00, 50¢15¢
 Canton Lawn Rake.....\$9.00, 50¢10¢
 Mt. Madison Prize Bow Brace and Peen.....65%
 Fort Madison Steel Tooth Lawn Rake.....\$6.00.....25%

Razor
 J. R. Torrey Razor Co.....20%
 Wostenholme and Butcher, \$10.00 to 2¢
 10%
 Jordan's AAA1, list Nov. 1, 1889.....50%
 Jordan's Old Faithful, list Nov. 1, '89, 50%
 Electric.....List net

Razor Straps—See Straps, Razor.
Rings and Ringers.
Bull Rings—
 Union Nut Co.....55%
 Sargent's.....60¢10¢70¢5¢
 Hotchkiss' low list.....70¢10%
 Humason, Beckley & Co.'s.....70¢10%
 Peck, Stow & W. Co.'s.....50¢10¢50¢10¢10%
 Elrich Hdw. Co., White Metal, low list.....50¢50¢10%

Hog—
 Top of the Hill Ringers.....# dos \$2.00
 Top of the Hill Ringers.....# dos \$1.25
 Hill's Improved Ringers.....# dos \$4.25
 Hill's Old Style Ringers.....# dos \$2.75
 Hill's Tongs.....# dos \$4.50
 Hill's Rings.....# dos bxs \$2.15 to 2.25
 Perfect Rings.....# dos bxs \$1.60 to 1.70
 Perfect Ringers.....# dos 15¢2¢
 Blair's Hog Ringers.....# dos \$2.25 to 2.50
 Blair's Hog Rings.....# dos 9¢4¢10¢
 Champion Ringers.....# dos \$2.00
 Champion Rings, Double.....# dos \$2.25
 Brown's Ringers.....# dos \$2.00
 Brown's Rings.....# dos \$1.25 to 1.30

Rivets and Burrs—
 Iron, list Nov. 17, '87.....40%
 Copper.....50¢10%
 Coppered Iron, Betina Brand.....40%

Rivet Sets—See Sets.
Rods—
 Stair, Brass.....25¢2¢
 Stair, Black Walnut.....# dos 40%

Rollers—
 Barn Door, Sargent's list.....60¢10¢10%
 Acme Moore's Anti-Friction.....55%
 Union Barn Door Roller.....70%

Rope—
 Manufacturers' prices:
 Manila.....¼ in. and larger # 15
 Manila.....¾ in. # 15¼¢
 Manila.....1 in. # 15½¢
 Manila.....1¼ and 1-18 in. # 15¼¢
 Manila Tarred Rope.....# 15¼¢
 Manila Hay Rope.....# 15¼¢
 Sisal.....¼ inch and larger # 12
 Sisal.....¾ in. # 12¼¢
 Sisal.....1 in. # 12½¢
 Sisal, Hay Rope.....# 12
 Sisal, Tarred Rope.....# 11¼¢
 Sisal, Medium Lathe Yarn, # 11 ½
 Cotton Rope.....# 15 to 18¢ net
 Jute Rope.....# 7¼¢

Wire—
 List May 1, 1886.....32¼¢22¼¢
 Iron, Galvanized.....40¢2½¢
 Cast Steel.....40¢2½¢

Rules—
 Boxwood.....80¢10¢10¢80¢10¢10¢5¢
 Ivory.....50¢50¢10%
 Starrett's Rules and Straight Edges, Steel.....25¢10%

Sad Irons—See Irons, Sad.
Sand and Emery Paper and Cloth—See Paper and Cloth, Sand and Emery.
Sash Cord—See Cord, Sash.
Sash Locks—See Locks, Sash.
Sash Weights—See Weights, Sash.
Sausage Stuffers or Fillers—See Stuffers or Fillers, Sausage.

Saws—
 Diston's Circular.....45%
 Diston's Cross Cuts.....45%
 Diston's Hand.....20%
 Woodrough & c Parlin.....25%
 Hand, Panel and Rip.....25%
 Narrow Champion Cross Cuts with Handles, # foot.....20%
 Champion Thin Back Cross Cuts, # foot.....23¢
 Champion Extra Thin Back Cross Cuts, # foot.....31¢
 One Man Champion Cross Cuts, # foot.....40%
 Wheeler, Madden & Clemson Mfg. Co. Hand, Panel and Rip.....30%
 Narrow Champion Cross Cuts with Handles, # foot.....20%
 Champion Thin Back Cross Cuts, # foot.....23¢
 Champion Extra Thin Back Cross Cuts, # foot.....31¢
 One Man Champion Cross Cuts, # ft. 40%

Atkins' Circular Shingle and Heading	dis 50%
Atkins' Silver Steel Diamond X Cuts	foot 70%
Atkins' Special Steel Dexter X Cuts	foot 50%
Atkins' Special Steel Diamond X Cuts	foot 32%
Atkins' Champion and Electric Tooth X Cuts	foot 30%
Atkins' Hollow Back X Cuts	foot 20%
Atkins' Mulay, Mill and Drag	40%
Atkins' One-Man Saw, with handles	foot 40%
Peace Circular and Mill	45%
Peace Hand Panel and Rip	35%
Peace Cross Cuts	45%
Richardson's Circular and Mill	45%
Richardson's X Cuts	45%
Richardson's Hand, &c.	25%

Hack Saws—	
Griffin's, complete	40% to 50%
Griffin's Hack Saw, Blades	40% to 50%
Star Hack Saws and Blades	25%
Eureka and Crescent	25%

Scroll—	
Lester, complete, \$10.00	25%
Rogers, complete, \$4.00	25%
Barnes' Builders' and Cabinet Makers'	25%
Barnes' Scroll Saw Blades	35%

Saw Frames—See Frames, Saw.

Saw Sets—See Sets, Saw.

Saw Tools—See Tools, Saw.

Scales—

Hatch, Counter, No. 171, good quality	foot \$21.00
Hatch, Tea, No. 161	foot \$6.75 to \$7.00
Union Platform, Plain	\$2.10 to \$2.20
Union Platform, Striped	\$2.30 to \$2.50
Chatillon's Grocers' Trip Scales	50%
Chatillon's Eureka	25%
Chatillon's Favorite	40%
Family Turnbolls	30% to 30% 10%
Riehl Bros.' Platform	40%

Scale Beams—See Beams, Scale

Scissors, Fluting.....45%

Scrapers—

Adjustable Box Scraper (S. R. & L. Co.)	\$6.50
Box, 1 Hand	foot \$4.00
Box, 2 Hand	foot \$6.00
Defiance Box and Ship	20% to 10%
Foot	50% to 60%
Ship, Common	foot \$5.50 net
Ship, R. I. Tool Co.	10%

Screen Window and Door

Frames—See Frames.

Screw Drivers—See Drivers, Screw.

Screws.

Bench and Hand—

Bench, Iron	55% to 10%
Bench, Wood, Beech	foot \$2.25
Bench, Wood, Hickory	20% to 10%
Hand, Wood	25% to 10%
Lag, Blunt Point, list Jan. 1, 1890	75% to 10%
Coach and Lag, Gimlet Point, list Jan. 1, 1890	75%
Bed	10% to 10%
Hand Rail, Sargent's	60% to 10%
Hand Rail, H. & B. Mfg. Co.	70% to 10%
Hand Rail, Am. Screw Co.	75%
Jack Screws, Millers Falls list	50% to 50%
Jack Screws, P. S. & W.	35%
Jack Screws, Sargent	40% to 10%
Jack Screws, Stearns	40% to 10%

Cork—

Humason & Beckley Mfg. Co. 40% to 10%

Williamson's 35% to 35%

Hows Bros. & Hulbert 35%

Machine—

Flat Head, Iron 55%

Round Head, Iron 50%

Wood—

List March 1, 1890

Flat Head Iron 50%

Round Head Iron 45%

Flat Head Brass 35%

Flat Head Bronze 45%

Round Head Bronze 35%

Rogers' Drive Screws 60%

Scroll Saws—See Saws, Scroll.

Scythe Snaths—See Snaths, Scythe.

Sets.

Atel and Tool.

Atkins' Sets, Awns and Tools

No. 20, foot \$10.00

Fray's Adj. Tool Hds., Nos. 1, \$12; 2, \$18;

3, \$12; 4, \$8.

Miller's Falls Adj. Tool Hds.

Nos. 1, \$12; 2, \$18.

Henry's Combination Hds. foot \$6.50

Brad Sets

No. 42, \$10.50; No. 43, \$12.50; 70% to 10%

Stanley's Excelsior

No. 1, \$7.50; No. 2, \$4.00; No. 3,

\$5.50.

Nail—

Square.....foot \$4.00 to \$4.25

Round.....foot \$3.25

Buck Bros.....27%

Cannon's Diamond Point.....foot \$12.20

Rivet.

Regular list.....50% to 10%

Saw—

Stillman's Genuine.....foot \$5.00 to \$7.75

Stillman's Imita.....foot \$3.25 to \$5.25

Common Lever.....foot \$2.00 to \$4.05

Morrill's No. 1, \$15.00; Nos. 3 & 4, \$24.00;

40% to 10%

Leach's, No. 0, \$8.00; No. 1, \$15; 15% to 20%

Nash's.....20% to 10%

Hammer, Hotchkiss.....\$5.50, 10%

Hammer, Bemis & Call Co.'s new Pat.

Bemis & Call Co.'s Lever and Spring

Hammer.....30% to 5%

Bemis & Call Co.'s Plate.....10%

Bemis & Call Co.'s Cross Cut.....12%

Alken's Genuine.....\$15.00, 50% to 10%

Alken's Imitation.....\$7.00, 55% to 2%

Hart's Pat. Lever.....20%

Disston's Star.....25%

Leopold.....40% to 10%

Atkin's Lever.....foot No. 1, \$6.00

Atkin's Criterion.....foot No. 1, \$6.00

Croissant (Keller), No. 1, \$15.00; 40% to 10%

\$24.00.

Avery's Saw Set and Punch.....50%

Chieftain H. R. Co.'s Superior.....foot \$15, 50%

Sharpeners, Knife.

Parkin's

Applewood Handles.....foot \$6.00, 40%

Rosewood or Cocobolo.....foot \$9.00, 40%

Shaves, Spoke.

Iron.....45%

Wood.....30%

Bailey's (Stanley R. & L. Co.).....40% to 10%

Stearns'.....30% to 10%

Cincinnati.....25% to 10%

Shears—

American (Cast) Iron.....75% to 10%

Barrett's Lamp Trimmers.....foot \$3.75

Tinners'.....30% to 2%

Seymour's, List, Dec. 1881.....60% to 10%

Heinisch's, List, Dec. 1881.....60% to 10%

Heinisch's Tailor's Shears.....50%

First quality C. S. Trimmers.....80% to 10%

Second quality C. S. Trimmers.....80% to 10%

Acme Cast Shears.....10% to 10%

Diamond Cast Shears.....10% to 10%

Clipper.....10% to 10%

Victor Cast Shears.....75% to 10%

Howe Bros. & Hulbert, Solid Forged

Steel.....40%

Chicago Drop Forge & F. Co., Solid

Steel Forged.....60%

Clauss Shear Co., Japaned.....70%

Clauss Shear Co., Nickel, same list net

Electric.....List net

Pruning Shears and Hooks.

Disston's Combined Pruning Hook and

Saw.....foot \$18.00, 20% to 10%

Disston's Pruning Hook, foot \$12.00,

20% to 10%

E. S. Lee & Co.'s Pruning Tools.....40%

Pruning Shears, Henry's Pat., foot

\$3.75 to \$4.00 net

Henry's Pruning Shears, foot \$4.25 to

4.50 net

Wheeler, M. & C. Co.'s Combination

Dunlap's Saw and Chisel, foot \$5.50, 30%

J. Mallinson & Co., No. 1, \$5.25; No. 2, 7.25

P. S. & W. Co.....60%

Tinners', &c.—

Shears and Snips (P. S. & W.).....20% to 25%

Snips, J. Mallinson & Co.....35% to 4%

Sheaves—

Sliding Door—

M. W. Co., list July, 1888.....50% to 10%

B. & E., list Dec. 18, 1888.....55% to 20%

Corbin's list.....60% to 10%

Patent Roller.....60% to 10%

Patent Roller, Hatfield's.....75%

Russell's Anti-Friction, list Dec. 18,

1888.....60% to 2%

Moore's Anti-Friction.....50%

Sliding Shutter—

R. & E. list Dec. 18, 1885.....60% to 10%

Sargent's list.....60% to 10%

Reading list.....60% to 10%

Ship Tools—

L. & J. J. White.....20% to 5%

Shoes, Horse, Mule, &c.—

Horse—

Burden's, Perkins', Phoenix, at factory.

\$4.00

Mule—

Add \$1 per keg to above prices.

Oz. Wrought—

Ton lots.....foot \$9

1000 lb lots.....foot \$9

500 lb lots.....foot \$10

Shot—

(Eastern prices 2% off, cash, 5 days.

Drop, foot bag, 25 lb.....\$1.40

Drop, foot bag, 5 lb......33

Buck and Chilled, foot 25-lb bag.....1.65

Buck and Chilled, foot 5-lb bag......38

Shovels and Spades—

Ames' Shovels, Spades, &c., list Nov. 1,

1885.....30%

Nore.—Jobbers frequently give 30% to 4%

extra on above.

Griffith's Black Iron.....50% to 10%

Griffith's C. S.....60% to 10%

Griffith's Solid C. S. R. Goods.....20%

Old Colony (Sanford Fork & Tool Co.) 30%

St. Louis Shovel Co.....20% to 10%

Bussey, Blinn & Co.....15% to 2%

Hubbard & Co.....30% to 10%

Lehigh Mfg. Co.....50% to 10%

Payne Pettibone & Son, list January,

1886.....30%

Remington's (Lowman's) Pat. foot \$10.40

Rowland's, Black Iron.....50% to 10%

Bowland's Steel.....60% to 10%

Shovels and Tongs—

Iron Head.....60% to 10%

Brass Head.....60% to 10%

Sieves—

Mann's Tin Rim.....50% to 25%

Buffalo Metallic, S. S. & Co.....50% to 25%

Shaker (Barber's) Pat. Flour Sifters.....

foot \$25.00; foot \$21.00

Electric.....foot \$21.00

A. & W. Sifters.....foot \$2.00

Hunter's.....foot \$2.00

Smith's Adjustable Sifters.....foot \$2.00

Smith's Adjustable Milk Strainer.....foot \$2.00

Smith's Adjustable T. & C. Strainer.....foot \$1.25

Staves, Wooden Rim—

Mesh 18, Nested, foot \$1.00

Mesh 20, Nested, foot \$1.10

Mesh 24, Nested, foot \$1.15

Skels. Thimble—

Western list.....75% to 10%

Columbus Wrt. Steel, Special net price

Coldbrookdale Iron Co.....60%

Utica F. S. T. Skels.....60%

Utica Turned and Fitted.....35%

Slates—

School, by case.....50% to 10%

Snaps, Harness, &c.—

Anchor (T. & S. Mfg. Co.).....65%

Fitch's (Sristol).....50% to 10%

Andrews.....70% to 10%

Sargent's Patent Guarded.....40% to 10%

Covert.....50% to 2%

Covert, New Pat.50% to 2%

Covert, New R. E.60% to 10%

Covert Spring.....60% to 10%

Snaths, Scythe.

List.....50% to 10%

Soldering Irons—See Irons, Solder-

ing.

Spittoons, Cuspidors, &c.

Standard Fiberglass—

Wire Brads & Nails, see Nails, Wire.
Steel-Wire Brads, R. & E. Mfg. Co.'s
list.....50&105

Tapes, Measuring—

American.....334&33455
Spring.....405
Chesterman's, Regular list.....25&305

Thermometers—

Tin Case.....80&80105

Thimble Skeins—See Skeins.

Ties, Bale—Steel

Standard Wire, list.....50&10&105

Tinners' Shears, &c.—See Shears, Tinners', &c.

Tinware—

Stamped, Japanned and Plated, list
Jan. 20 1887.....70&10&70&10&105

Tire Benders, Upsetters, &c.— See Benders and Upsetters, Tire.

Tools.

Coopers'—

Bradley's.....205
Barton's.....30&20&55
L. & J. White.....20&55
Albertson Mfg. Co.....255
Beatty's.....305
Sandusky Tool Co.....30&30&55
Shaves, Cincinnati Tool Co.....205

Lumber.

Ring Peavies, "Blue Line".....\$ doz \$20.00
Ring Peavies, Common.....\$ doz \$18.00
Steel Socket Peavies.....\$ doz \$21.00
Mail Iron Socket Peavies.....\$ doz \$19.00
Cant Hooks, "Blue Line".....\$ doz \$16.00
Cant Hooks, Common Finish.....\$ doz \$14.00
Cant Hooks, Mail, Socket Clasp, "Blue
Line" Finish.....\$ doz \$16.00
Cant Hooks, Mail, Socket Clasp, Com-
mon Finish.....\$ doz \$14.50
Cant Hooks, Clip Clasp, "Blue Line"
Finish.....\$ doz \$14.00
Cant Hooks, Clip Clasp, Common Fin-
ish.....\$ doz \$12.00
Hand Spikes.....\$ doz 6 ft., \$15.00; 8 ft.,
\$20.00
Pike Poles, Pike & Hook.....\$ doz, 12 ft.,
\$11.50; 14 ft., \$12.50; 16 ft., \$14.50;
18 ft., \$17.50; 20 ft., \$21.50
Pike Poles, Pike only.....\$ doz, 12 ft.,
\$10.00; 14 ft., \$11.00; 16 ft., \$13.00; 18
ft., \$16.00; 20 ft., \$20.00
Pike Poles, not ironed.....\$ doz, 12 ft.,
\$6.00; 14 ft., \$7.00; 16 ft., \$9.00; 18
ft., \$12.00; 20 ft., \$16.00
Setting Poles.....\$ doz, 12 ft., \$14.00; 14
ft., \$15.00; 16 ft., \$17.00
Swamp Hooks.....\$ doz \$18.00

Saw.

Atkins' Perfection.....\$ doz \$17.00
Atkins' Excelsior.....\$ doz \$20.00
Atkins' Giant.....\$ doz \$4.00

Tobacco Cutters—See Cutters, To- bacco.

Transom Lifters—See Lifters, Transom.

Traps—

Game—

Newhouse.....40&40&55
Onedia Patent.....70&105
Game, Blake's Patent.....40&10&55

Mouse and Rat—

Mouse Wood Choker, 7 dor holes, 11&125
Mouse, Round Wire.....\$ doz \$1.50, 105
Mouse, Cage, Wire.....\$ doz \$2.50, 105
Mouse, Catch 'em alive.....\$ doz \$2.50, 155
Mouse, Bonanza.....\$ gr
Mouse, Delusion.....\$ gr
Rat, Decoy.....\$ gr \$10.00, 105
Ideal.....\$ gr \$10.00
Cyclone.....\$ gr \$5.25
Hotchkiss Metallic Mouse, 5-hole traps,
\$ doz, 90¢; in full cases, \$ doz, 75¢
Hotchkiss Imp. Rat Killer.....\$ gro \$18.50
Hotchkiss New Rat Killer.....\$ gro \$10.50
Schuyler's Rat Killer.....\$ gro \$16.00

Triers—

Butter and cheese.....255

Trimmers, Spoke.

Bonney's.....\$ doz \$10.00, 505
Stearns.....\$ doz \$10.00, 20&105
Ives, No. 1, \$15.00; No. 2, \$12.00.....20&105
Douglas.....\$ doz \$0.00, 205
Cincinnati.....255

Trowels—

Lethrop's Brick and Plastering.....30&10&5&355
Rod's Brick and Plastering.....155
Diaston's Br'k and Plastering.....255
Peace's Plastering.....255
Clement & Maynard's.....205
Rose's Brick.....15&205
Brady's Brick.....255
Worral's Brick and Plastering.....305
Garden.....705

Trucks, Warehouse, &c.—

B. & L. Block Co.'s list, '82.....405

Tubes, Boiler—

See Pipe.

Twine—

Flax Twine— DC. B.
No. 9, 10 and 11 Balls.....25 345
No. 12, 13 and 14 Balls.....25 335
No. 18, 19 and 20 Balls.....22 325
No. 24, 25 and 26 Balls.....22 325
No. 36, 37 and 38 Balls.....20 315
No. 204, Mattress, 1/4 and 1/2 Balls.....50&55
Chalk Line, Cotton, 1/2 B Balls.....255
Mason Line, Linen, 1/2 B Balls.....555
2-Ply Hemp, 1/4 and 1/2 B Balls (Spring
Twine).....1555
3-Ply Hemp, 1 B Balls.....10&105
3-Ply Hemp, 1 1/2 B Balls.....10&105
Cotton Wrapping, 5 Balls to B.....15&105
2, 3, 4 and 5-Ply Jute, 1/2 B Balls.....105
Wool.....655
Paper.....13&145
Cotton Mops, 6, 9, 12 and 15 B to doz.....155

Vises—

Solid Box.....50&10&50&10&55

Parallel—

Fisher & Norris Double Screw.....15&105
Stephens.....25&305
Parker's.....305
Wilson's.....555
Howard's.....405
Bonney's.....40&105
Miller Falls.....40&105
Trenton.....40&50&105
Merrill's.....15&205
Sargent's.....60&10&105
Bachus & Union.....405
Double Screw Leg.....15&105
Prentiss.....30&255
Simpson's Adjustable.....405
Moore's.....305

Saw Vises—

Bonney's, Nos. 2 & 3, \$15.00.....40&105
Stearns.....33&4&10&33&4&10&105
Stearns' Silent Saw Vises.....33&4&355

Sargent's.....605&105
Hopkins.....\$ doz \$17.50, 105
Reading.....40&105
Wentworth.....20&105
Combination Hand Vises.....\$ gr \$42.00
Cowell Hand Vises.....205
Bauer's Pipe Vises.....105
Cincinnati.....25&105

Wagon Boxes—See Boxes, Wagon.

Washer Cutters—See Cutters, Washer.

Wagon Jacks—See Jacks, Wagon.

Ware, Hollow, Enameled, &c.

Cast Iron, Hollow—
Stove Hollow-Ware—
Groen.....55&5&60&55
Ungrind.....65&10&65&10&55
White Enameled-Ware—
Maslin Kettles.....60&10&55
Boilers and Saucepans.....405
Tinned Boilers and Saucepans.....405
Festive Hollow-Ware.....50&50&55
Gray Enameled-Ware—
Stove.....505
Maslin Kettles.....60&10&105
Boilers and Saucepans.....40&55
Enameled—
Agate and Granite Ware, list Jan. 1,
1889.....33&4&105
Ironclad Enameled Ware.....dis 33&4&105

Kettles—

Galvanized Tea-Kettles—

Each.....\$ 55¢ 60¢ 65¢ 75¢

Standard Fiber—

Wash-Basins, 10 1/2 in.....\$2.00 \$2.25
Wash-Basins, 12 in.....2.25 2.75
Keelers, 11 1/4 in.....4.00
Cuspidors.....8.00
Spittoons, "Daisy," 8 in.....4.00 4.50
Spittoons, "Daisy," 8 in.....4.00 4.50
Half-Peck Measures.....3.50

See also Pails.

Indurated Fiber—255

Spittoons, No. 2, \$ doz.....\$9.00
Basins, Ringed, \$ doz, No. 2, \$4.80;
No. 3.....\$4.20
Washbuds, Nested, Nos. 0, 1, 2 and 3 (4
pieces), \$ nest.....\$7.50
Keelers, Nested, Nos. 1, 2, 3 and 4 (4
pieces), \$ nest.....\$7.50
Butter Bowls, 15, 17 and 19-inch (3
pieces), \$ nest.....\$2.25
Liquid Measures, pt., qt., 2 qt. and fun-
nel (4 pieces), \$ set.....\$3.00
Dry Measures, 1, 2, 4, 8 and 16 qts (5
pieces), \$ set.....\$5.00

See also Pails.

Silver Plated, Hollow—

4 mo. or 5¢ cash in 30 days.
Reed & Barton.....
Meriden Britannia Co.....40&55
Stapton Hall, Miller & Co.....
Rogers & Brother, Inc.....
Hartford Silver Plate Co.....
William Rogers Mfg. Co.....40&55

Washers—

Size.....1/4 5-16 3/8 1/2 5/8 3/4 1
Washers.....65¢ 54¢ 41¢ 35¢ 3 3 3
In lots less than 200, \$ B, add 1/4¢, 5-8
boxes 1¢ to list.

Wedges—

Iron.....\$ B 3 3/4
Steel.....\$ B 4 4

Weights, Sash—

Solid Eyes.....\$ ton \$18&19

Well Buckets, Galvanized—See

Buckets, Well, Galvanized.

Wheels, Well.

8 in., \$2.25; 10 in., \$2.70; 12 in., \$3.25

Wire and Wire Goods—

Iron—

Market.
Br. & Ann'd, Nos. 0 to 18.....721/2
Cop'd, Nos. 0 to 18.....705
Galv., Nos. 0 to 18.....621/2
Tin'd, Tinned list Nos. 0 to 18.....621/2
Stone.
Br. & Ann'd, Nos. 16 to 18.....721/2
Bright and Ann'd, Nos. 19 to 30.....755
Br. & Ann'd, Nos. 27 to 36.....771/2
Tinned.
Tinned Broom Wire, 18 to 21, 1/2 B.....545
Galvanized Fence, Nos. 8 and 9.....655
Annealed Fence, Nos. 8 and 9.....755
Annealed Grade, Nos. 10 to 18.....755
Brass, list Jan. 18, 1888.....255
Copper, list Jan. 18, 1888.....255
Barb Fence.....See Trade Report
Annealed Wire on Spools.....505
Main's Steel and Tin'd on Spools.....505
Main's Brass and Cop. on Spools.....405
Cast Steel Wire.....\$3.00 to \$2.30
Stub's Steel Wire.....\$3.00 to \$2.30
Steel Music Wire, Nos. 12 to 30.....655
Picture Wire.....New list 505
Wire Clothes Lines, see Lines.

Bright Wire Goods—

Standard list.....\$855

Wire Cloth and Netting.

Painted Screen Cloth, good quality,
\$ 100 sq. ft., \$1.60 @ \$1.75
Galvanized Wire Netting.....70&10&755

Wire Rope—See Rope, Wire.

Wrenches—

American Adjustable.....405
Baxter's Adjustable "S".....40&10&505
Baxter's Diagonal.....40&10&505
Cox's Genuine.....50&55
Cox's "Mechanics".....50&10&55
Girard Standard.....65&105
Lamson & Sessions' Engineers'.....60&105
Lamson & Sessions' Standard.....70&105
F. S. & W. Agricultural.....755
Girard Agricultural.....755
Lamson & Sessions' Agric'l.....755

Pat. Combination.....355

Merrick's Pattern.....355

Briggs' Pattern.....255

Cylinder or Gas Pipe.....40&55

No. 3 Pipe.....40&105

Aiken's Pocket (Bright).....\$6.00, 50&105

The Favorite Pocket.....\$ doz \$4.00, 405

Webster's Pat. Combination.....255

Boardman's.....20&105

Always Ready.....25&55

Aligator.....505

Donohue's Engineers'.....20&105

Acme, Bright.....50&55

Acme, Nickleed.....40&25

Walker's.....55&35

Diamond Steel.....55&35

Cincinnati Brace Wrenches.....25&105

Taft's Vice Wrench.....55&10&25

Wringers, Clothes—

List March 11, 1889, 25¢ cash.

Wrought Goods—

Staples, Hooks, &c., list Jan. 12, 1889,
\$0&15&655

PAINTS, OILS AND COLORS.—Wholesale Prices.

Animal and Vegetable Oils.

Linseed, City, raw.....per gal. 62 @ 64
Linseed, City, boiled.....68 @ 66
Linseed, Western, raw.....58 @ 60
Lard, City, Extra Winter.....51 @ 53
Lard, City, Prime.....51 @ 52
Lard, City, Extra No. 1.....45 @ 46
Lard, City, No. 1.....42 @ 43
Lard, Western, prime.....51 @ 52
Cotton-seed, Crude, prime.....28 @ 30
Cotton-seed, Crude, grades.....22 @ 20
Cotton-seed, Summer Yellow, prime.....34 @ 35
Cotton-seed, Summer Yellow, off grades.....80 @ 33
Sperm, Natural Spring.....66 @ 68
Sperm, Bleached Spring.....71 @ 73
Sperm, Natural Winter.....77 @ 76
Sperm, Bleached Winter.....78 @ 81
Whale, Crude.....40 @ 45
Whale, Natural Winter.....49 @ 51
Whale, Bleached Winter.....51 @ 52
Whale, Extra Bleached.....54 @ 55
Sea Elephant, Bleached.....80 @ 62
Menhaden, Crude, Sound.....20 @ 22
Menhaden, Crude, Southern.....22 @ 24
Menhaden, Light Pressed.....32 @ 34
Menhaden, Bleached W'ter.....35 @ 36
Menhaden, Extra Bleached.....35 @ 45
Tallow, City, prime.....7 @ 7
Tallow, Western, prime.....7 @ 7
Cocoanut, Ceylon.....75 @ 8
Cocoanut, Cochiti.....85 @ 34
Cod, Foreign.....85 @ 34
Red Elaine.....31 @ 34
Red Saponified.....\$ B 44&45
Bank.....24 @ 26
Straits.....25 @ 26
Olive, Italian, bbls.....81 @ 83
Neatfoot, prime.....62&64 75
Palm, prime, Lagos.....54&55 64

Mineral Oils.

Black, 29 gravity, 25 @ 30
cold test.....8 @ 9
Black, 29 gravity, 15 cold
test.....81&6 94
Black, 29 gravity, summer.....7
Cylinder, light, filtered.....@

Cylinder, dark, filtered.....14 @ 20
Cylinder, dark, st'm refined.....10 @ 18
Paraffine, 23 1/4 @ 24 gravity.....11 @ 12
Paraffine, 25 gravity.....10 @ 11
Paraffine, 28 gravity.....34 @ 9
Paraffine, red, 31 @ 22 gr'ty.....14 @ 14 1/2
Paraffine, red, 23 1/4 @ 23 gr'ty.....12 @ 13

Paints and Colors.

Barytes, Prime White.....\$ ton \$22.00 @ 22.50
Barytes, Amer. refined.....20.00 @
Barytes, Amer. No. 1.....15.00 @
Barytes, Amer. No. 2.....16.00 @
Barytes, Amer., off-color.....13.00 @ 15.00
Blue, Celestial.....\$ 54 @ 74
Blue, Chinese.....45 @ 50
Blue, Prussian.....20 @ 35
Blue, Ultramarine.....7 @ 25
Brown, Spanish.....1/4 @ 1
Brown, Vandyke, Amer.....3 @ 8 1/2
Brown, Vandyke, English.....6 @ 8
Black, English Drop.....8 @ 10
Black, Frankfort, Drop.....12 @ 14
Black, Lamp, common.....12 @ 18
Black, Lamp, medium.....19 @ 25
Black, Lamp, prime.....27 @ 33
Carmine, No. 40, in bulk.....3.10 @
Carmine, No. 40, in boxes.....3.20 @
Carmine, No. 40, in ounce
bottles.....4.20 @
Chalk, in bulk.....\$ ton 1.75 @ 2.00
Chalk, in bbls.....\$ 100 B 30 @ 35
China Clay, English.....\$ ton 13.50 @ 18.00
China Clay, Southern.....10.00 @ 11.50
Cobalt Oxide, prep'd.....2.90 @
Cobalt Oxide, black.....lots 100B 2.60 @
Cobalt, Oxide, black.....less 100B 2.65 @
Crocus Martius, Engl. \$ B.....1 1/2 @ 2 1/2
Crocus, American.....1 1/2 @ 2 1/2
Green, Paris, in bulk.....14 @ 14 1/2
Green, Paris, 170 @ 175 B.....14 @ 15
Green, Paris, small pack.....14 @ 15
Green, Chrome, ordinary.....8 @ 13
Green, Chrome, pure.....2 @ 25
Lead, Eng. B.B. white.....9 @ 10
Lead, Ann. White, dry or in oil.....@ 7 1/2
Kegs, lots less than 1000 B.....@ 6 1/2
Kegs, lots 1000 B to 5 tons.....@ 6 1/2

Kegs, lots 5 tons to 12 tons.....@ 6 1/2
Kegs, lots 12 tons and over.....@ 6 1/2
Lead, White, in oil, 25 B tin
pails, add to keg price.....@ 1
Lead, White, in oil, 12 1/2 B tin
pails, add to keg price.....@ 1
Lead, White, in oil, 1 to 5 B as-
sorted tins, add to keg price.....@ 2 1/2
Lead, Red, bbls. and 1/2 bbls.....6 1/4 @ 7
Lead, Red, kegs.....6 1/4 @ 7 1/4
Litharge, kegs.....6 1/4 @ 7 1/4
Litharge, bbls. and 1/2 bbls.....6 1/4 @ 7

TERMS, &c.—Lead and Litharge.—On lots of 1000 B or over, 60 days' time or 2 1/2 % discount for cash if paid within 15 days of date of invoice.

Ocher, Rochelle.....1.35 @ 1 1/4
Ocher, French Washed.....1 1/4 @ 3 1/2
Ocher, German Washed.....1 1/4 @ 3 1/2
Ocher, American.....1 1/4 @ 1 1/4
Orange Mineral, English.....84 @ 94
Orange Mineral, French.....9 @ 9 1/4
Orange Mineral, German.....84 @ 94
Orange Mineral, American.....2 @ 3 1/2
Paris White, English Cliff
stone.....90 @ 1.10
Paris White, American.....70 @ 80
Red, Indian, English.....54 @ 7
Red, Indian, American.....2 @ 6
Red, Turkey.....9 @ 14
Red, Tuscan.....9 @ 11
Red, Venetian, American.....\$ 105 1/2 90 @ 1.25
Red, Venetian, English.....1.00 @ 1.15

Sienna, Italian, Burnt and
Powd. \$ B.....5 @ 6 1/4
Sienna, Ital., Burnt Lumps.....14 @ 34
Sienna, Ital., Raw, Powd.....5 @ 6 1/4
Sienna, Ital., Raw Lumps.....2 @ 3 1/2
Sienna, American, Raw.....14 @ 14
Sienna, American, Burnt
and Powdered.....14 @ 14
Talc, French.....14 @ 14
Talc, American.....1 @ 1 1/4
Terra Alba, Fr'ch, \$ 100 B.....72 @ 80
Terra Alba, English.....80 @ 85
Terra Alba, American No. 1.....70 @ 75
Terra Alba, American No. 2.....38 @ 40
Umber, Turkey, Bnt. and
Powd., \$ B.....34 @ 4
Umber, Turkey, Raw and
Powd., \$ B.....34 @ 4
Umber, Turkey, R'w Lumps.....24 @ 24
Umber, Turkey, Bnt. Amer.....14 @ 14

Umber, Turkey, R'w Amer.....14 @ 14 1/2
Yellow, Chrome.....10 @ 23
Vermilion, Americ. Lead.....11 1/2 @ 13
Vermilion, Quicks' er, bulk.....@ 75
Vermilion, Quicks' er, bags.....@ 70
Vermilion, Quicksilver,
smaller pkgs.....@ 80
Vermilion, English Import.....53 @ 55
Vermilion, Imitation, Eng.....5 @ 25
Vermilion, Trieste.....75 @ 80
Vermilion, Chinese.....88 @ 90
Whiting, Common, \$ 100 B.....40 @ 45
Whiting, Gliders'.....50 @ 55
Zinc, American, dry.....\$ B 4 @ 10 1/4
Zinc, French, Red Seal.....@ 7 1/2
Zinc, French, Green Seal.....@ 8 1/2
Zinc, French, V. M. X.....64 @
Zinc, Antwerp, Red Seal.....@ 7 1/2
Zinc, Antwerp, Green Seal.....@ 8
Zinc, German, L. Z. O.....@ 6 1/2
Zinc, V. M. in Poppy Oil.
Seal, lots of 1 ton and
over.....104 @ 11
lots less than 1 ton.....104 @ 11 1/4
Zinc, V. M. in Poppy Oil.
Red Seal.....@
lots of 1 ton and over.....94 @ 10 1/4
lots of less than 1 ton.....10 @ 10 1/2

DISCOUNTS.—French Zinc.—Discounts to buyers of 10 bbl. lots of one or as- sorted grades, 1 1/2 %; 25 bbls, 2 1/2 %; 50 bbls, 4 %. No discount allowed on less than bbl. lots.

Colors in Oil.

Blue, Chinese.....\$ B 35 @ 40
Blue, Prussian.....29 @ 45
Blue, Ultramarine.....12 @ 18
Brown, Vandyke.....8 @ 13
Green, Chrome.....8 @ 13
Green, Paris.....15 @ 18
Sienna, Raw.....7 @ 13
Sienna, Burnt.....7 @ 13
Umber, Raw.....7 @ 10
Umber, Burnt.....7 @ 10

Glue.

Low Grade.....\$ B 8 @ 10
Cabinet.....12 @ 14
Medium White.....13 @ 15
Extra White.....17 @ 20
French.....9 @ 20
English.....10 @ 15
Irish.....12 @ 15

CURRENT METAL PRICES.

SEPTEMBER 3, 1890.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market reports.

IRON AND STEEL.

Bar Iron from Store.

Common Iron:	
1 to 2 in. round and square.	2.00 @ 2.10
1 to 6 in. x 1/2 to 1 in.	
Refined Iron:	
1 to 2 in. round and square.	2.10 @ 2.30
1 to 4 in. x 1/2 to 1 1/2 in.	2.20 @ 2.40
4 1/2 to 6 in. x 1/2 to 1 in.	2.30 @ 2.50
1 to 6 in. x 1/2 and 5-16.	2.40 @ 2.60
Rods—5/8 and 1-1/2 round and sq.	2.40 @ 2.60
Bands—1 to 6 x 3-16 to No. 12.	2.40 @ 2.60
"Burden Best" Iron, base price.	2.90 @
Burden's "H. B. & S." Iron, base price.	2.70 @
"Ulster"	2.90 @
Norway Bars	4.90 @
Norway Shapes	4.90 @

Merchant Steel from Store.

Open-Hearth and Bessemer Machinery, Toe Calk, Tire and Sleigh Shoe, base price in small lots.	3 3/4
Best Cast Steel, base price in small lots	5
Best Cast Steel Machinery, base price in small lots.	5

Sheet Iron from Store.

	Common American.	R. G. Cleaned.
10 to 16.	3.00 @ 3.00	3.50 @
17 to 20.	3.25 @ 3.25	3.50 @ 3.75
21 to 24.	3.35 @ 3.35	3.75 @
25 and 26.	3.45 @	3.75 @
27 and 28.	3.55 @ 3.62 1/2	4.00 @
29.	3.75 @	4.25 @
	B. B.	2d qual.
Galv'd, 14 to 30.	5.00 @	4.75 @
Galv'd, 21 to 24.	5.37 1/2 @	5.12 1/2 @
Galv'd, 25 to 26.	5.75 @	5.50 @
Galv'd, 27.	6.12 1/2 @	5.85 1/2 @
Galv'd, 28.	6.50 @	6.23 @
Patent Platinized	10 1/2 @	10 1/2 @
Russia	10 1/2 @	10 1/2 @
American Cold Rolled B. B.	5 1/2 @	7 1/2 @
Craig Polished Sheet Steel	8 1/2 @	

English Steel from Store.

Best Cast	13
Extra Cast	16 1/2
Swaged, Cast	16
Best Double Shear	15
Blister, 1st quality	12
German Steel, Best	10
2d quality	9
2d quality	8
Sheet Cast Steel, 1st quality	15
2d quality	14
2d quality	12 1/2
R. Musket's "Special"	45
"Titanic"	30

METALS.

Tin.

Banca, Figs.	22 3/4
Straits, Figs.	22 3/4
Straits in Bars	25

Tin Plates.

	Charcoal Plates.—Bright.	Per box.
Melny Grade.	IC, 10 x 14.	6.25
"	IC, 12 x 12.	6.50
"	IC, 14 x 20.	6.25
"	IC, 20 x 28.	12.75
"	IX, 10 x 14.	7.75
"	IX, 12 x 12.	8.00
"	IX, 14 x 20.	7.75
"	IX, 20 x 28.	15.50
"	DC, 12 1/2 x 17.	5.75
"	DX, 18 1/2 x 17.	7.25
Calland Grade.	IC, 10 x 14.	6.25
"	IC, 12 x 12.	6.50
"	IC, 14 x 20.	6.15
"	IX, 10 x 14.	7.40
"	IX, 12 x 12.	7.65
"	IX, 14 x 20.	7.40
Allaway Grade.	IC, 10 x 14.	5.35
"	IC, 12 x 12.	5.50
"	IC, 14 x 20.	5.35
"	IC, 20 x 28.	10.75
"	IX, 10 x 14.	6.50
"	IX, 12 x 12.	6.65
"	IX, 14 x 20.	6.50
"	IX, 20 x 28.	13.25
"	DC, 12 1/2 x 17.	5.00
"	DX, 18 1/2 x 17.	6.00

Coke Plates.—Bright.

test Coke.—IC, 10 x 14, 14 x 20..	.....	@	\$5.12 1/2
10 x 20..	.....	@	7.25
20 x 28..	.....	@	10.25
IX, 10 x 14, 14 x 20..	.....	@	6.00
BV Grade.—IC, 10 x 14, 14 x 20..	.....	@	4.87 1/2

Charcoal Plates.—Terne.

Dean Grade.—IC, 14 x 20.. .. .	Ⓒ	\$5.00
20 x 28.. .. .	Ⓒ	10.00
IX, 14 x 20.. .. .	Ⓒ	5.80
20 x 28.. .. .	Ⓒ	11.60
Abecarne Grade.—IC, 14 x 20.. .. .	Ⓒ	4.85
20 x 28.. .. .	Ⓒ	9.87
IX, 14 x 20.. .. .	Ⓒ	5.80
20 x 28.. .. .	Ⓒ	11.60

Tin Boiler Plates.

IX, 14 x 26.	112 sheets.	\$13.00 @ \$13.00
IX, 14 x 28.	112 sheets.	@ 13.25
IX, 14 x 31.	112 sheets.	@ 14.75

Copper.

Duty: Pig, Bar and Ingot, 4¢; Old Copper, 3¢
B. Manufactured (including all articles of which Copper is a component of chief value), 45 ¢ ad valorem.

Ingot.

Lake	@ 17 1/2
Baltimore Grade.	@ 15

Sheet and Bolt.

Prices adopted by the Association of Copper Manufacturers of the United States, June 27, 1890, being quotations for all sized lots.

	Not wider than	Not longer than	And longer than	Over 64 oz.	64 oz.	32 oz.	16 oz.	14 oz.	12 oz.	10 oz.	8 oz.	Less than 8 oz.
80	72			25	25	25	26	27	28	31	33	
80	72			25	25	25	26	27	28	30	34	
80	96			25	25	25	27	29	30	33	36	
80	96			25	25	25	28	30	34	39		
48	96			25	25	27	29	31	35			
48	96			25	25	28	30	32	36			
60	96			25	25	30	32	37				
60	96			25	28	31						
84	96			26	27							
84	96			27	28							
Over 84 in. wide				28	30							

All Bath Tub Sheets. 16 oz. 14 oz. 12 oz. 10 oz.
Per pound. 20.27 0.29 0.31 0.35
Bolt Copper, 3/4 inch diameter and over, per pound. 25¢
Circles, 60 inches in diameter and less, 3 cents per pound advance over lowest prices of Sheet Copper of the same thickness.
Circles, over 60 inches diameter, up to 96 inches diameter, inclusive, 5 cents per pound advance over lowest prices of Sheet Copper of the same thickness.
Circles, over 96 inches diameter, 6 cents per pound advance over lowest prices of Sheet Copper of the same thickness.
Segment and Pattern Sheets, 3 cents per pound advance over price of sheets required to cut them from.
Cold or Hard Rolled Copper, 14 ounces per square foot and heavier, 1 cent per pound over the foregoing prices.
Cold or Hard Rolled Copper, lighter than 14 ounces per square foot, 2 cents per pound over the foregoing prices.

Copper Bottoms, Pits and Flats.

	Per pound.
14 ounce to square foot and heavier.	29¢
12 ounce and up to 14 ounce to square foot.	30¢
10 ounce and up to 12 ounce.	32¢
Circles less than 8 inches diameter 5 cents per pound additional.	
Circles over 13 inches diameter are not classed as Copper Bottoms.	

Tinning.

Tinning sheets on one side, 10, 12 and 14 x 48 each. 8¢
Tinning sheets on one side, 30 x 60 each. 30¢
For tinning boiler sizes, 9 in. (sheets 14 in. x 60 in.), each. 15¢
For tinning boiler sizes, 8 in. (sheets 14 in. x 56 in.), each. 12¢
For tinning boiler sizes, 7 in. (sheets 14 in. x 52 in.), each. 12¢
Tinning sheets on one side, other sizes, per square foot. 2 1/2¢
For tinning both sides double the above prices.

Platinized Brass and Copper.

14 and 16 oz. and heavier. 31¢. By the case. 30¢	
12 oz. and lighter. 33¢. By the case. 32¢	
24 x 48 and 30 x 60.	
14 and 16 oz. and heavier. 44¢. 12 oz. 37¢	

Seamless Brass and Copper Tubes.

O. G.	N. G.	1/8	3/16	1/4	5/16	3/8	1/2	3/4	1	1 1/4
8-14	6-12	30	35	32	31	30	29	26		
15	13	40	35	33	32	31	30	27		
16	14	41	36	34	33	32	31	27		
17	15	42	37	35	32	33	32	28		
18	16	44	38	36	34	33	32	29		
19	17	45	39	37	35	34	33	31		
20	18-19	46	41	39	38	37	36	33		
21	20	48	43	41	40	39	38	36		
22	21	50	44	42	41	40	39	38		
23	22	52	46	44	43	42	41	41		
24	23	55	48	46	45	44	43	43		
25	24	58	51	48	47	46	45	47		

Copper, Bronze and Gilding Tube, 3¢ additional.

Brazed Brass Tubing. (To No. 20, inclusive.

Above 5-16 inch to 3 inch, inclusive.	35¢
Plain, above 3 inch.	45¢
Plain, 5-16 inch.	45¢
Plain, 1/4 inch.	50¢
Plain, 3-16 inch.	50¢
Plain, 1/2 inch.	1.50
Fancy Tubing, Brass, to No. 20, inclusive.	43¢
bronze Tubing, 3¢ more than Brass.	
Discount from list.	25 @ ... 1

Roll and Sheet Brass.

Discount from list. 30 ¢

High Brass Rods.

Over 1 inch diameter.	30¢
1/4 inch to 1 inch diameter, both inclusive.	36¢
No. 8 and less than 1/4 inch diameter.	32¢
Smaller than No. 8.	32¢
Hexagon, Octagon and Square, 2¢ advance over Round Rods.	

Spelter.

Duty: Pig, Bars and Plates, \$1.50 @ 100 lb.	
Western Spelter	6 1/2
"Bertha"	8

Zinc.

Duty: Sheet, 2 1/2¢ @ lb.	
600 lb casks	6 1/2
Per lb.	7 1/4

Lead.

Duty: Pig, \$3 @ 100 lb. Old Lead, 3¢ @ lb. Pipe and Sheets, 5¢ @ lb.	
American	4 1/2
Bar	5
Pipe, subject to trade discount.	7
Tin-Lined Pipe, subject to trade discount.	15¢
Block Tin Pipes, subject to trade discount.	40¢
Sheet, subject to trade discount.	7 1/4

Solder.

1/2 @ 1/2 (Guaranteed)	15
No. 1.	12
Extra Wiping.	11 1/2
The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.	

Antimony.

Cookson.	25
Hallett's.	21 1/2

ALUMINUM.

Prices in Ingots.

\$2.00 @ lb in lots of 1000 lb and over.	
\$2.25 @ lb in lots of 500 lb and over.	
\$2.50 @ lb in lots of 100 lb and over.	

Prices Per Pound on Rolled Sheets.

(Brown & Sharpe, Standard Gauge.)

	2 in.	10 in.	14 in.	18 in.	22 in.
Wider than.	10 in.	14 in.	18 in.	22 in.	24 in.
And including.					
Up to No. 20 inclusive.	\$2.50	\$2.60	\$2.80	\$3.00	\$3.20
Nos. 21, 22, 23 and 24.	2.60	2.70	2.90	3.10	3.3
Nos. 25 (0.0179 in.) and 26 (0.0154 in.) inclusive.	2.70	2.80	3.00	3.20	3.4
Nos. 27 and 28.	2.80	2.90	3.10	3.30	3.50

Sheets, thinner than No. 28 gauge and wider than 24 inches, special prices not less than \$5 per pound.
Add 35 cents per pound for sheets cut to particular widths and lengths.
Sheets rolled to .001 in. and under, 50 cents per ounce.
Leaf in books, 20 cents per book; \$2 per pack of 10 books, sheets 5 x 6 inches.

Aluminum Tubing.

From \$4 per pound upward, according to size and thickness of walls.

Aluminum Castings.

From 50 cents upwards per pound extra over the cost of the metal in ingots, according to the number wanted, weight, the difficulty of casting, cost of patterns, &c.

Aluminum Wire in Coils.

(Brown & Sharpe, Standard Gauge.)

	Per lb
All numbers up to No. 14 (.064 in.) inclusive.	\$3.00
Nos. 15 (.05706 in.) to 22 (.02534 in.) inclusive.	3.25
Nos. 23 (.02571 in.) and 24 (.0201 in.) inclusive.	3.50
Nos. 25 (.0179 in.) and 26 (.0154 in.) inclusive.	3.75
Nos. 27 (.014195 in.) and 28 (.012641 in.) inclusive.	4.00
Nos. 29 (.011257 in.) and 30 (.010023 in.) inclusive.	4.25
No. 31 (.008928 in.)	4.50
No. 32 (.00795 in.)	4.75
No. 33 (.00708 in.)	5.00
No. 34 (.00630 in.)	5.25
No. 35 (.00561 in.)	5.50
No. 36 (.00500 in.)	6.25
No. 37 (.00445 in.)	7.00
No. 38 (.003965 in.)	8.50
No. 39 (.003531 in.)	12.00
No. 40 (.003144 in.)	16.00

Spooling, on 1-pound spools, 15 cents per pound extra
Spooling, on 10-pound spools, 5 cents per pound extra